Vol. 1039 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

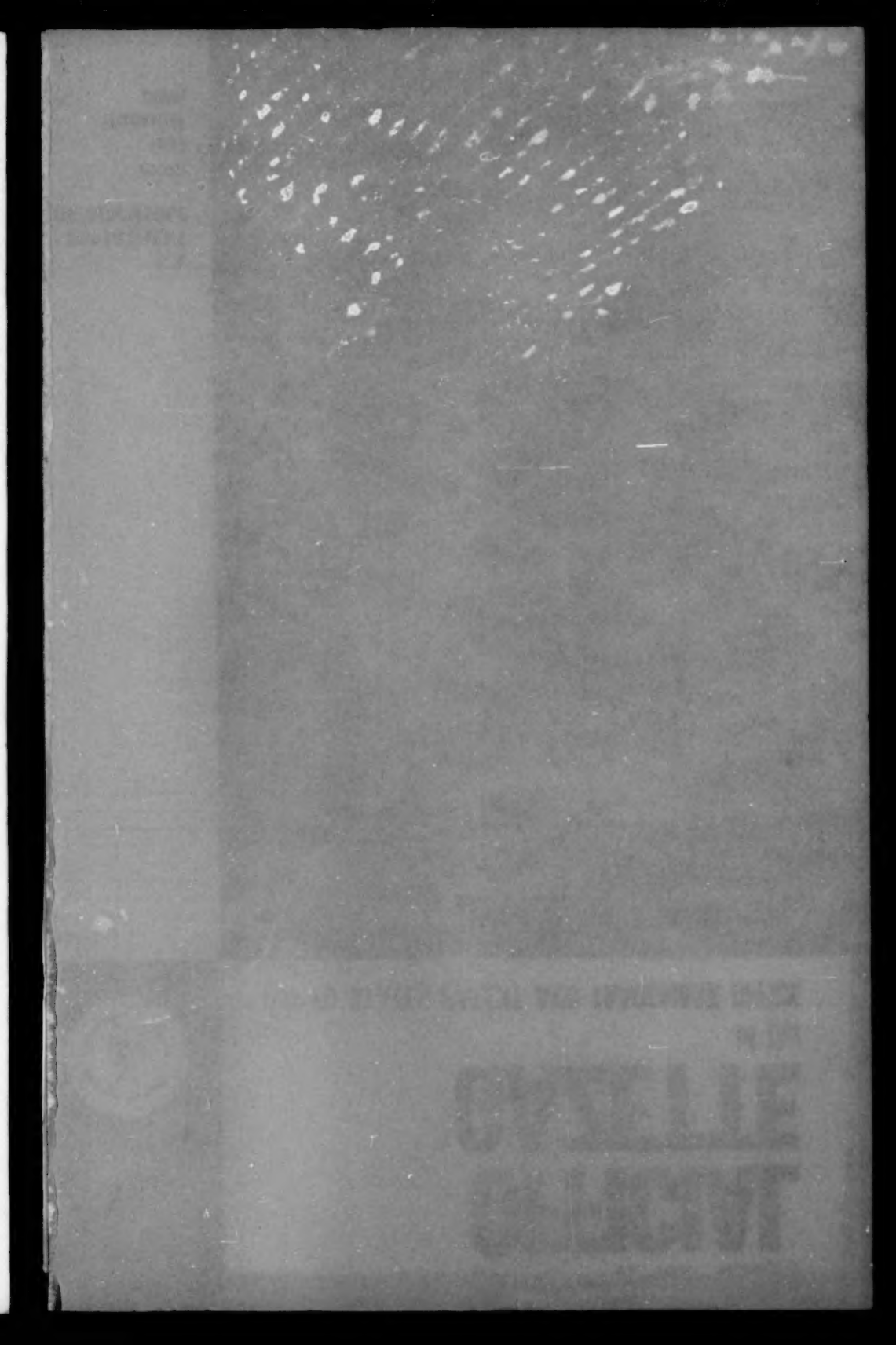
PATENTS

February 21, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS



OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 21, 1984 Volume 1039 Number 3

CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1039 OG	142
Reissue Applications Filed	1039 OG	142
Request for Reexamination Filed	1039 OG	142
Change in Search Fee for the European Patent Office as International Searching Authority	1039 OG	142
Certified Copies of Trademark Applications/Registrations	1039 OG	142
Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette dated Jan. 17, 1984	1039 OG	143
Trademark Exposition	1039 OG	143
New Patent Granted Cover	1039 OG	144
Patent Certificates of Correction	1039 OG	145
Disclaimers	1039 OG	145
Disclaimers and Dedications	1039 OG	145
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1039 OG	146
Condition of Patent Applications	1039 OG	147
Reexaminations		923
Reissue Patents Granted (31,524)		925
Plant Patents Granted (5,193)		927
Patents Granted		
General and Mechanical (4,432,099)		929
Chemical (4,432,769)		1155
Electrical (4,433,198)		1273
Design Patents Granted (272,674)		1357
Index of Patentees		PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees		PI 50
Classification of		
Patents (Including Reissues and Reexaminations)		PI 53
Designs and Plants		PI 56
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 57
Designs and Plants		PI 58
Change of Address Form and Subscription Order Form		Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly, effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The Search fee for the European Patent Office was changed as of Feb. 14, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,282,255, Re. S.N. 519,391, Filed Aug. 1, 1983, Cl. 426/7, METHOD AND STARTER COMPOSITIONS FOR THE GROWTH OF ACID PRODUCING BACTERIA AND BACTERIAL COMPOSITIONS PRODUCED THEREBY, William E. Sandine, et al., Owner of Record: *The State of Oregon by and Through the Oregon State Board of Higher Education on Behalf of Oregon State University, Corvallis, Oreg.,* Attorney or Agent: Kenneth S. Klarquist, et al., Ex. Gp.: 172

4,287,021, Re. S.N. 519,369, Filed Aug. 1, 1983, Cl. 162/358, EXTENDED NIP PRESS, Edgar J. Justus, et al., Owner of Record: *Beloit Corp., Beloit, Wis.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 173

4,296,014, Re. S.N. 407,284, Filed Aug. 11, 1983, Cl. 260/29.659, AQUEOUS DISPERSION TYPE THERMOSETTING COATING COMPOSITION, Masaaki Hayashi, et al., Owner of Record: *Inventor,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 144

4,324,245, Re. S.N. 535,088, Filed Sept. 23, 1983, Cl. 128/287, COMFORMABLE DISPOSABLE DIAPERS HAVING ABSORBENT PANEL WITH BULGED SIDE MEMBERS, Frederick K. Mesek, et al., Owner of Record: *Johnson & Johnson, New Brunswick, N.J.,* Attorney or Agent: Leonard P. Prusak, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,238,568, Reexam. No. 90/000,490, Requested: Jan. 23, 1984, Cl. 435/285, ROLLER BOTTLE, Robert W. Lynn, Owner of Record: *Becton, Dickinson and Co., Rutherford, N.J.,* Attorney or Agent: Kane, Dalsimer, et al., Ex. Gp.: 174, Requester: James W. Badie, New York, N.Y.

4,396,391, Reexam. No. 90/000,489, Requested: Jan. 23, 1984, Cl. 8/181, TREATING CELLULOSE TEXTILE FABRICS WITH DIMETHYLOL DIHYDROXYETHYLENEUREAPOLYOL, Bernard F. North, Owner of Record: *Requester,* Attorney or Agent: Cynthia Berlow, Ex. Gp.: 144, Requester: Sun Chemical Corp., New York, N.Y.

Change in Search Fee for the European Patent Office as International Searching Authority

The International Bureau has informed the U.S. Patent and Trademark Office that, due to a more favorable exchange rate for the US dollar, the International Search Fee for the European Patent Office as International Searching Authority will decrease from $670 to $620 for United States applicants. The reduced Search Fee becomes effective on Feb. 14, 1984.

Other PCT fees remain unchanged as follows:

Transmittal fee	$ 125.00
Search fee for the U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
Basic Fee (first 30 pages)	295.00
Basic Supplemental Fee (each page over 30)	6.00
Designation fee (each country or region)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

Certified Copies of Trademark Applications/Registrations

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

MARGARET M. LAURENCE,
Jan. 17, 1984. *Assistant Commissioner for Trademarks.*

Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated Jan. 17, 1984

Copies of the Official Gazette dated Jan. 17, 1984 were not mailed until Jan. 23, 1984. Therefore, for marks published in the Official Gazette dated Jan. 17, 1984, Notices of Opposition filed by Feb. 22, 1984 will be considered timely.

MARGARET M. LAURENCE
Jan. 27, 1984. *Assistant Commissioner for Trademarks.*

Trademark Exposition

The Patent and Tradmark Office is holding its Second Annual National Trademark Exposition in the Tourist Information Center (formerly the "Great Hall" and the Patent Office Search Room) in the Herbert C. Hoover Bldg. (Main Commerce), 14th St. and Constitution Ave., N.W., Washington, D.C., on Saturday and Sunday, July 7th and 8th, 1984.

There will be a $100.00 fee for exhibitors. Parties wishing to exhibit should contact Peter Harab, at (703) 557-5237.

MARGARET M. LAURENCE,
Dec. 16, 1983. *Assistant Commissioner for Trademarks.*

NEW PATENT GRANT COVER

The Patent and Trademark Office is pleased to announce the winner of the contest recently conducted for a new design of the patent grant document.

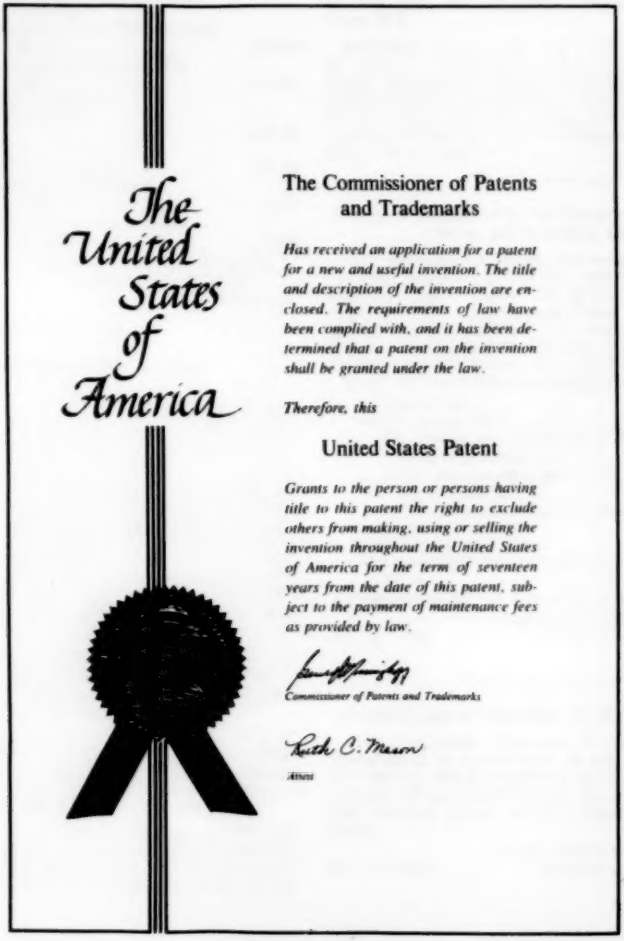
A distinghished panel of impartial judges selected the entry submitted by Mrs. Marina Kazragis of Chevy Chase, Maryland. Mrs. Kazragis received $500 for the winning entry and an invitation to appear at the National Inventors Day ceremonies for the unveiling of the new design.

The new covers will be printed on off-white paper. The border and distinctive vertical rules will be printed in blue, and the text will be printed in black. The grant will be bound with brass fasteners, and the red ribbon will be sealed with a gold seal. The new covers will be used on patents issued on or after July 3, 1984.

A reduced size of the new patent cover is illustrated below.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

February 13, 1984.


The United States of America
The Commissioner of Patents and Trademarks
Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.
Therefore, this
United States Patent
Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.
Commissioner of Patents and Trademarks
Attest

PATENT NOTICES

Certificates of Correction for the Week of Feb. 21, 1984

3,663,706	4,377,862	4,401,225	4,409,460
4,001,836	4,377,923	4,401,506	4,409,672
4,199,919	4,378,308	4,402,056	4,409,706
4,224,209	4,382,083	4,402,796	4,410,249
4,259,472	4,383,135	4,403,578	4,410,417
4,288,297	4,384,071	4,404,085	4,410,685
4,288,355	4,384,362	4,404,217	4,411,268
4,291,549	4,385,347	4,404,221	4,412,300
4,299,856	4,385,414	4,404,271	4,413,017
4,301,119	4,386,099	4,404,305	4,413,319
4,320,750	4,388,315	4,404,321	4,413,399
4,324,798	4,389,317	4,404,557	4,413,467
4,342,078	4,389,734	4,404,871	4,413,945
4,351,834	4,390,528	4,404,919	4,414,988
4,352,275	4,391,409	4,405,035	4,415,970
4,355,101	4,391,908	4,405,094	4,417,528
4,356,328	4,391,967	4,405,597	4,417,573
4,356,366	4,392,141	4,405,618	4,417,662
4,360,458	4,392,152	4,405,631	4,419,116
4,362,078	4,392,423	4,406,166	4,419,308
4,362,506	4,393,538	4,407,149	4,419,402
4,367,199	4,396,975	4,407,333	4,420,166
4,368,136	4,398,268	4,407,500	4,420,675
4,368,413	4,398,315	4,408,066	4,421,067
4,370,390	4,398,708	4,408,235	4,421,885

Disclaimers

4,311,806.—*Daniel L. Dufour,* Longmeadow, Mass. POLYBLENDS OF PVC AND STYRENE-MALEIC ANHYDRIDE-RUBBER COPOLYMERS. Patent dated Jan. 19, 1982. Disclaimer filed Sept. 12, 1983, by the assignee, *Monsanto Co.*

Hereby enters this disclaimer to all claims of said patent.

4,413,895.—*James K. Lee,* Pittsford, N.Y. ELECTROMAGNETIC ACTUATOR HAVING A COMPLIANT ARMATURE. Patent dated Nov. 8, 1983. Disclaimer filed Dec. 21, 1983, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to claims 1-24 of said patent.

Disclaimers and Dedications

Des. 267,145.—*Hogara Kaneko,* Fujisawa, Japan. STRAP TIGHTENER AND CUTTER. Patent dated Dec. 7, 1982. Disclaimer and Dedication filed Dec. 15, 1983, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

4,390,047.—*Hogara Kaneko,* Fujisawa, Japan. TOOL FOR STRAP TENSIONING AND CUTTING. Patent dated June 28, 1983. Disclaimer and Dedication filed Dec. 15, 1983, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

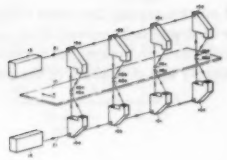
Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

FEBRUARY 21, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,671,726 (165th)
ELECTRO-OPTICAL APPARATUS FOR PRECISE ON-LINE MEASUREMENT OF THE THICKNESS OF MOVING STRIP MATERIAL
James R. Kerr, Tigard, Oreg., assignor to Coe Manufacturing Co., Painesville, Ohio
Reexamination Request No. 90/000,205, May 25, 1982.
Reexamination Certificate for Patent No. 3,671,726, issued Jun. 20, 1972, Ser. No. 827,266, May 23, 1969.
Int. Cl.³ G01B *11/06*
U.S. Cl. 364—563



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **6–13** is confirmed.

Claims **14–16** were previously disclaimed.

Claims **1** and **17** are determined to be patentable as amended:

Claims **2–5**, dependent on amended claims, are determined to be patentable.

New claims **18–20** are added and determined to be patentable.

1. Apparatus for monitoring and determining the instantaneous position of a surface of a [moving] strip of material *moving in a path of travel past said apparatus*, comprising:

(a) means for projecting a [spot] *point* of light on [the] *said* surface of said *moving strip* [material];

(b) means for gathering [reflected] light *reflected* from said *projected point* [spot formed on said surface] and projecting *said gathered light to form* a real image of said [spot] *point* on a plane; and

(c) photodetection means for determining the position of said image on said plane relative to a predetermined point on said plane, said photodetection means providing a quantified electrical signal output indicative of said image position and representative of the instantaneous relative position of said [strip] surface at the [cross-sectional] location *of said projected point of light* [where said light spot is incident thereon].

B1 3,903,158 (166th)
PROCESS FOR REDUCING THE BIURET CONTENT IN UREA
Jose C. Fuentes, Mixcoac, and Ramon X. Marin, Satelite, both of Mexico, assignors to Guanos y Fertilizantes de Mexico, S.A., Mexico Reexamination Request No. 90/000,218, Jun. 16, 1982.
Reexamination Request No. 90/000,218, Jun. 16, 1982.
Reexamination Certificate for Patent No. 3,903,158, issued Sep. 2, 1975, Ser. No. 361,008, May 16, 1973.
Int. Cl.³ C07C *126/00*
U.S. Cl. 564—073

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6**, having been finally determined to be unpatentable, are cancelled.

[**1**. A process for preferentially reducing any undesirable biuret content in urea having a low amount of biuret in the range of 2.92 per cent or less on a dry weight basis as an impurity relative to said urea, said urea comprising either molten urea or urea in aqueous solution having concentrations of 1.0 to 99.9% of urea, in which said molten urea or said urea in solution is placed in contact with acidic or basic ion exchangers.]

B1 4,123,415 (167th)
REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED RESISTANCE TO HEAT DEFLECTION
Allen D. Wambach, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.
Reexamination Request No. 90/000,203, May 24, 1982.
Reexamination Certificate for Patent No. 4,123,415, issued Oct. 31, 1978, Ser. No. 747,636, Dec. 6, 1976.
The portion of the term of this patent subsequent to Jul. 27, 1983, has been disclaimed and dedicated (1035 O.E. 28).
Int. Cl.³ C08K *3/40*
U.S. Cl. 524—451

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13**, having been finally determined to be unpatentable, are cancelled.

[**1**. A reinforced thermoplastic composition having improved retention of heat deflection temperature, said composition comprising:

(a) a high molecular weight polyester resin; and

(b) a reinforcement therefor comprising glass fibers, said glass fibers having an average standard diameter of no greater than about 0.0005 inches, wherein the glass fibers are present in an amount at least sufficient to provide reinforcement and to improve the resistance to deflection by heat of said composition in comparison with a reinforced composition including glass fibers having an average standard diameter of greater than about 0.0005 inches.]

B1 4,349,070 (168th)

TUBE MAT HEAT EXCHANGER

Michael F. Zinn; Steven E. Krulick, and Ronald W. Leonard, all of Ellenville, N.Y., assignors to Bio-Energy Systems, Inc., Ellenville, N.Y.

Reexamination Request No. 90/000,397, Jun. 6, 1983.
Reexamination Certificate for Patent No. 4,349,070, issued Sep. 14, 1982, Ser. No. 178,885, Aug. 18, 1980.
Division of Ser. No. 17,728, Mar. 5, 1979, Pat. No. 4,270,596.
Int. Cl.³ F28F 9/02
U.S. Cl. 165—173

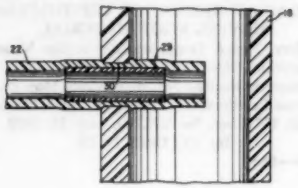
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–4 is confirmed.

1. In a heat exchanger wherein at least one fluid-conducting tube of elastomeric material having a certain inside and outside diameter communicates with the interior of a hollow manifold through a cylindrical hole in the wall thereof, connecting means joining the tube to the manifold comprising:

(a) a rigid cylindrical insert having an outside diameter at least as great as the inside diameter of the tube and an axial length greater than the axial length of the cylindrical hole in the manifold wall and pre-fitted within an end portion of the tube;

(b) the hole in the manifold wall having a diameter greater than the insert outside diameter and less than the tube diameter around said insert; and



(c) the tube end portion around the insert being located and compressed within said hole entirely from the exterior of the hollow manifold with the respective ends of the insert extending inwardly and outwardly of the manifold wall.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,524

APPARATUS FOR THE DETECTION AND PROCESSING OF ELECTRIC SIGNALS

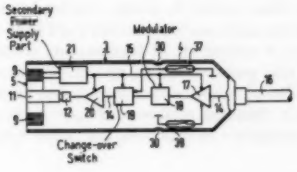
Peter Hoebel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Original No. 4,236,086, dated Nov. 25, 1980, Ser. No. 953,189, Oct. 20, 1978. Application for reissue Mar. 26, 1981, Ser. No. 247,839

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752783

Int. Cl.[3] H02J *3/00*

U.S. Cl. 307—149 38 Claims



1. Apparatus for the detection and processing of electric signals, comprising a signal transmitter part and a signal processing part, primary and secondary coupling members providing signal path interconnection of said signal transmitter part and said signal processing part, and comprising a galvanically separative coupling location in the signal path interconnection between said primary and secondary coupling members, detachably interengageable contact plug means adjoining each other at the galvanically separative coupling location and comprising a contact plug part (2, 2') on the side of the signal processing part (1) and a plug-in contact part (3, 3') on the side of the signal transmitter part (16), each pair of interconnected primary and secondary coupling members (8, 9; 10, 11) of the contact plug means having one of the pair of interconnected coupling members (8; 10) disposed in the contact plug part (2, 2') on the side of the signal processing part (1) and having the other of the pair of interconnected coupling members (9; 11) disposed in the corresponding plug-in contact part (3, 3') of the signal transmitter part (16) so that upon establishment of the signal path interconnection between the signal transmitter part (16) and the signal processing part (1) each pair of coupling members (8, 9; 10, 11) join together in spatial proximity as primary and secondary coupling members to form a galvanically separative coupling therebetween at the galvanically separative coupling location, the coupling location of the contact plug means having associated therewith at a common interface (5, 40) primary and secondary coupling members (10; 11) for a use signal transmission and further primary and secondary coupling members (8; 9) providing energy transmission for power supply coupling, characterized in that, as primary and secondary coupling members for the use signal transmission, fiber optic light guide port elements (11; 10) are provided, of which a first port element (10) is disposed in the contact plug part (2, 2') on the side of the signal processing part (1) and the other fiber optic light guides port element (11) is located in the corresponding plug-in contact part (3, 3') of the signal transmitter (16), so that in the plugged-in state the fiber optic light guide port elements of the one and the other side are positioned relative to one another to provide an essentially continuous (seamless) signal transmission path.

PLANT PATENTS

GRANTED FEBRUARY 21, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,193

AFRICAN VIOLET PLANT

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Jun. 21, 1982, Ser. No. 390,799

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet known by the cultivar name Fairy Princess, and described and illustrated, and particularly characterized by its profuse flowering and vigorous growth habit, with the flowers being held above the foliage on erect peduncles to form a massive colorful bouquet, its flowers which range in color from essentially entirely purple to entirely white, and all ranges of variegation of these colors.

5,194

DIGITARIA DIDACTYLA GRASS PLANT

Hubert F. Whiting, Fallbrook, Calif., assignor to AMFAC Garden Perry's Inc., Ventura, Calif.

Filed Dec. 15, 1982, Ser. No. 432,977

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—88 1 Claim

1. A new variety of Digitaria Didactyla grass plant herein shown and described by a moderate bluish-green color as defined by the ISCC-NBS centroid color chart; this new variety has an earlier spring green color of a more open and upright growth habit with stolons that are glabrous except for a few hairs around the nodes; the anthers are a dark purple color as defined by the ISCC-NBS centroid color chart; the stigmas are of a strong reddish-purple color as defined by the ISCC-NBS centroid color chart.

PATENTS

GRANTED FEB. 21, 1984

ERRATA

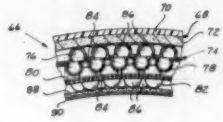
For CLASS	See PATENT NO.
502–005	4,432,889
502–062	4,432,890
528–045	4,433,017
381–001	4,433,209
381–053	4,433,210
290–044	4,433,248
377–116	4,433,372

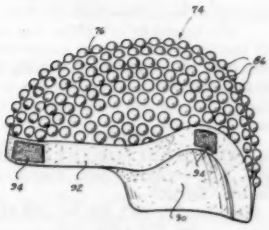
PATENTS

GRANTED FEBRUARY 21, 1984

GENERAL AND MECHANICAL

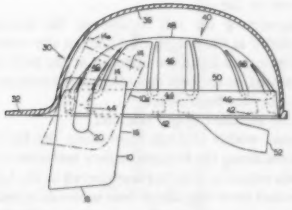
4,432,099
INDIVIDUALLY FITTED HELMET LINER
Shelly J. Grick, Jermyn, and Joseph A. Beautz, Forest City, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.
Filed Jul. 9, 1982, Ser. No. 396,777
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—412 **6 Claims**





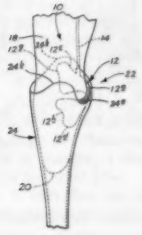
4. A helmet liner including in combination a plurality of layers conforming generally to the top of a wearer's head, said layers being assembled in superposed contacting relationship with one another and each comprising a sheet formed with spaced pockets on at least one side thereof, said sheets being elastic at normal temperatures and plastically deformable at elevated temperatures to permit adjustment of the effective thickness of said liner, said pockets being open and unfilled to allow their deformation in response to compressive contact with an adjacent layer.

4,432,100
PROTECTIVE HELMET VISOR
Ronald E. Bates, Rte. 1, Box 23, Midland, Va. 22728
Filed Apr. 16, 1982, Ser. No. 369,010
Int. Cl.³ A42B *3/00;* **A61F** *9/04*
U.S. Cl. 2—424 **6 Claims**



6. A protective transparent visor for a hard hat helmet including an inverted bowl and a liner cap releasably joined at a plurality of points spaced apart along the interior circumference of said inverted bowl, said visor comprising a transparent plastic sheet defining at least a pair of elongated linear slots having a substantially vertical orientation, said slots being spaced apart and each said slot being adapted to surround one said point at which said liner cap joins said bowl, so that the upper edge of said visor rests against said bowl between said liner cap and said bowl, and a lower edge of said visor extends beneath said bowl to provide a gripping surface for single-handed movement of said visor into and out of said bowl, and wherein said visor is pressed against the interior of said bowl by said liner cap so that friction between said bowl and said visor maintains said visor in a stationary position until adjusted by a wearer.

4,432,101
CUSHIONING PATELLAR SUPPORT DEVICE
Betty J. Johnson, P.O. Box 453, La Grande, Oreg. 97850
Filed Mar. 1, 1982, Ser. No. 353,618
Int. Cl.³ A61F *1/12, 1/02*
U.S. Cl. 3—20 **2 Claims**



1. An adjustable, cushioning, non-limb-surrounding, patellar support device for use in conjunction with a prosthesis of the type designed for below-the-knee amputees, where such prosthesis includes a stump-receiving cavity defined with an upwardly facing rim having a valley portion therein at the front side of the prosthesis joined integrally with a pair of lateral-support hill portions which extend above the valley portion on opposite lateral sides of the prosthesis, said device comprising

an insertable/removable, generally butterfly-shaped, flexible, inflatable/deflatable bag having enlarged, spaced wings which are joined through a central reduced-dimension neck, said bag being freely placeable within such cavity on the front side thereof, with upper marginal portions of the bag extending along a path generally following that of the above-mentioned valley and hill rim portions in the prosthesis slightly above the valley rim portion, and with opposite extremities of said wings extending to positions along the lateral sides of the prosthesis short of the back side,

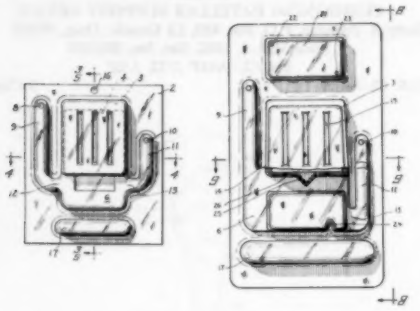
conduit means communicating with said bag for supplying and exhausting inflation fluid therefor, and

user-manipulatable inflation/deflation means coupled for fluid communication with said conduit means, actuatable reversibly and infinitely to inflate and deflate said bag.

4,432,102
DISPENSING PACKAGE FOR AUTOMATICALLY RELEASING A CONTROLLED AMOUNT OF AN ADDITIVE SOLUTION INTO A WATER TANK AND BOWL
Keith Woodruff, Mountainside, and Arturo A. Villamarin, Mine Hill, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.
Filed Oct. 21, 1981, Ser. No. 313,408
Int. Cl.³ E03D *9/02, 9/01*
U.S. Cl. 4—228 **16 Claims**

1. A dispensing device for a flushable toilet tank comprising

means to contain a compressed tablet of a solid additive, means to contain an aqueous solution of said solid additive, said aqueous solution containing means being positioned below said tablet containing means with an opening communicating between said additive tablet containing means and said solution containing means, means to admit water into said device, means to pass a predetermined quantity of said aqueous solution out of said device during a flush cycle, and means to control contact between said tablet and said aqueous solution to obtain a desired concentration of said aqueous solution; said water admitting means and said means to pass a predetermined quantity of said aqueous solution out of said device being in liquid contact with the water in the toilet tank during quiescent periods.



16. A dispensing device for a flushable toilet tank comprising a first cavity adapted to contain a tablet of a solid, water-soluble additive, a second cavity adapted to contain an aqueous solution of said additive and positioned below said first cavity, an opening communicating between said first and second cavities, a pair of standpipes each being positioned separately adjacent to said cavities, and having a port in the upper portion thereof opening to said tank, the bottom of each standpipe being in communication with the second cavity and the port of one standpipe being positioned above the second cavity and the other port such that a predetermined quantity of said aqueous solution is passed out of said second cavity into said tank during a flush cycle, said standpipes being connected to the second cavity in such a manner that contact between said tablet and said aqueous solution is controlled to obtain a desired concentration of said aqueous solution.

4,432,103

STEAM BATH APPARATUS AND LIQUID OR STEAM TREATMENT EQUIPMENT

Walter Hunziker, Villastrasse 14, 6010 Kriens, Switzerland

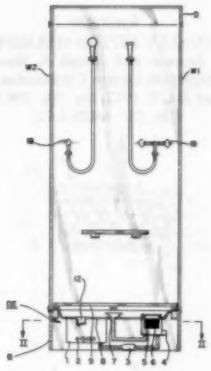
Filed Aug. 25, 1981, Ser. No. 296,230

Claims priority, application European Pat. Off., Aug. 26, 1980, 80810265.1

Int. Cl.³ A61H *33/06*

U.S. Cl. 4—525 **18 Claims**

1. A steam bath apparatus comprising a cabinet with an access opening adapted to be closed by door means; a steam generating system located in said cabinet and including an evaporation surface, heating means for heating said evaporation surface and for heating liquid to be evaporated, a liquid outlet for supplying liquid to be evaporated onto said evaporation surface, collecting means for collecting any non-evaporated liquid from said evaporation surface, and pumping means having an inlet and an outlet for recirculating said non-evaporated liquid to said liquid outlet; said collecting means comprising a tub having a floor and disposed at the bottom of said cabinet and covered by a grating, said evaporation surface comprising at least a part of said floor of said tub, said liquid outlet comprising nozzle means located above said floor of said tub and below said grating for dispensing a heated layer of



liquid flowing over said evaporation surface for generating steam within said cabinet.

4,432,104

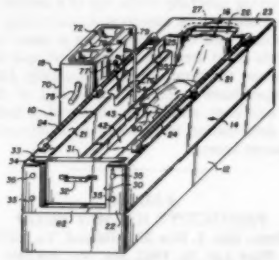
BATHING EQUIPMENT FOR THE HANDICAPPED

Jack S. Sasaki, 3231 Wellington Ave., Vancouver, British Columbia, Canada V5R 3X9

Filed Jun. 28, 1982, Ser. No. 393,181

Int. Cl.³ A47K *3/12*

U.S. Cl. 4—555 **10 Claims**



1. Bathing equipment for a handicapped bather normally requiring a wheelchair, said equipment comprising:

a tub having a bottom surface extending between foot and head ends of the tub,

a base supporting the tub to dispose the bottom surface substantially at the height of a seat on the wheelchair,

said tub having an entrance opening at the foot end,

a gate mounted on the foot end to close the entrance opening and contain the bath water,

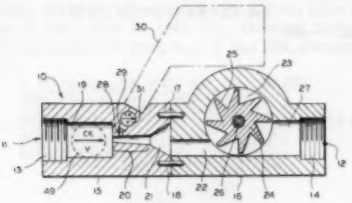
a bath chair installed in the tub, and

guide means within the tub supporting the bath chair for movement along the bottom surface between the head and foot ends whereby a bather transferred to the bath chair at the foot end from the wheelchair is movable back first and in a sitting, legs outstretched, position to the head end of the tub, said guide means comprising a guide channel extending longitudinally of the bottom surface, said guide channel having a level portion for supporting the bath chair near the gate and a ramp portion for supporting the bath chair near the head end of the tub, said bath chair having a wheel base frame endwise movable within the guide channel and a seat projecting laterally of the base frame over the bottom surface.

4,432,105
SHOWER DEVICE

Pravin G. Pitroda, 401 Fairlane Dr., Joliet, Ill. 60435

Filed Nov. 18, 1981, Ser. No. 322,467
Int. Cl.³ A47K 3/22
U.S. Cl. 4—597 8 Claims



1. A shower device apparatus for combining a first liquid stream with selected secondary liquids into a mixed liquid outflow comprising:

an inlet for said first liquid stream at its first end;

an outlet for said outflow at its second end;

fluid conduit means for the passage of said liquid stream therethrough communicating with said inlet at its upstream end and with said outlet at its downstream end;

injection means interposed between said inlet and said outlet to inject selected ones of said secondary liquids into said first liquid stream within said fluid conduit;

said injection means having venturi means along a portion of its length so as to result in said secondary liquids being drawn into said fluid conduit; and

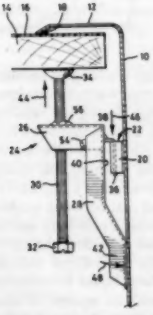
main mixing means positioned intermediate said injection means and said outlet in a postion, substantially within said fluid conduit and cooperating with said venturi means to deliver said outflow in mixed fashion;

said main mixing means including rotatable impeller means positioned proximate said outlet for contact with and mixing of said first and second liquids into said liquid stream.

4,432,106
CLAMP ASSEMBLY FOR SELF-RIMMING SINKS OR BASINS

Ronald A. Smith, Willowdale, Canada, assignor to Arro-Mac Manufacturing Inc., Mississauga, Canada

Filed Sep. 20, 1982, Ser. No. 420,266
Claims priority, application Canada, Jun. 23, 1982, 405816
Int. Cl.³ A47K 3/16; E03C 1/33
U.S. Cl. 4—633 11 Claims



1. A clamp assembly for use with a self-rimming sink or basin intended for mounting through an opening in a supporting counter structure which has an upper surface over which the rim of said sink or basin will fit, and having an under surface, where said sink or basin has a bowl and a plurality of brackets secured at least intermittently around the outer surface of said bowl at positions intermediate the height of said bowl, and where each of said brackets has a downwardly facing opening from the top thereof adjacent the outer surface of said bowl at said bracket, comprising:

a generally L-shaped clamp structure having a first, generally horizontally disposed arm, and a second, generally vertically disposed leg depending downwardly from said arm;

a bolt threadably received in and passed substantially perpendicularly through said arm, and having engageable means at the lower end of said bolt by which said bolt may be turned, and means at the upper end of said bolt for engaging the under surface of said supporting structure;

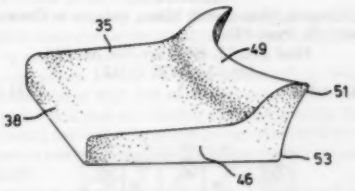
and a clamp arm spaced from the side of said leg opposite said arm, and depending downwardly from a clamping shoulder upstanding from said leg, said clamp arm being substantially parallel to the contiguous portions of said leg and being spaced therefrom a sufficient distance to accommodate one of said brackets;

where the lower portion of said leg is offset from the upper portion thereof in a direction away from said arm and to an extent that it will contact the outer surface of said bowl at a place below the bracket with which said clamp arm is engaged, and so as to keep said bolt substantially in a vertical orientation.

4,432,107
NECK SUPPORT REST

Robert F. Clark, 180 George St., Rockwood, Ontario, Canada (N0B 2K0), and Hugh A. Smythe, 2 Heathbridge Park Rd., Toronto, Ontario, Canada (M4G 2Y6

Filed Oct. 1, 1981, Ser. No. 307,639
Claims priority, application United Kingdom, Oct. 7, 1980, 8032331
Int. Cl.³ A47G 9/00
U.S. Cl. 5—436 5 Claims



1. A neck support rest comprising a unitary body of resilient material, the body having a base portion with top and bottom surfaces, a rear edge and a front edge, and an upstanding ridge along the said front edge, the top of the ridge projecting forwardly with respect to the bottom of the front edge of the body in order to ensure that the ridge can tuck into and hence support the lower neck region of a person lying on his side with his head on the base portion, the front edge of the base portion merging smoothly into the ridge, to define a forwardly and upwardly sloping profile, the forwardly projecting top of the ridge tending to deform downwardly and forwardly under the imposition of downward pressure thereon.

4,432,108
THERAPEUTIC LEG SUPPORT

Gerda L. Chapman, 1805 Montana Ave., Coeur d'Alene, Id. 83814

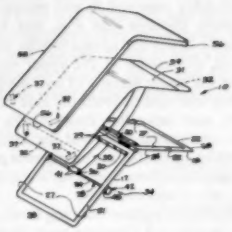
Filed Oct. 9, 1981, Ser. No. 309,922
Int. Cl.³ A47C 21/00
U.S. Cl. 5—443 13 Claims

1. An adjustable therapeutic leg support, comprising:

a pair of rigid frame members hinged for pivotal motion about a transverse hinge axis and including an upper leg support frame member with an upper leg support surface and an opposed bottom surface on one side of the hinge

axis and a lower leg support frame member with a lower leg support surface and an opposed bottom surface on an opposite side of the hinge axis;

said rigid frame members including free outside end edges with surfaces thereon for directly contacting a supporting surface such as a bed;



means interconnecting the frame members on opposite sides of the hinge axis for adjustably positioning the frame members about the hinge axis at any desired angular relationship between an unfolded orientation wherein both frame members are substantially flat and a folded orientation wherein both frame members are substantially upright and face one another.

4,432,109

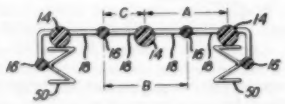
PLASTIC SUPPORT PLATFORM FOR MATTRESS STRUCTURE

Paul J. Huspeni, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Jan. 25, 1982, Ser. No. 342,216

Int. Cl.³ A47C *23/32*

U.S. Cl. 5—478 **11 Claims**



1. A mattress comprising a plurality of spaced springs, a plastic support platform having a plurality of extruded unoriented plastic spaced longitudinal support members and a plurality of extruded unoriented plastic spaced longitudinal stabilizing members, at least one of said stabilizing members being in position in each space between said longitudinal support members, said stabilizing members being smaller than said support members, a plurality of extruded plastic spaced cross-stabilizing members that intersect said support and stabilizing members substantially at a right angle and are integrally joined at the crossings, said cross-stabilizing members being oriented and smaller than said longitudinal support members, said support platform being in position on top of said springs with said longitudinal support members extending along the length of the mattress in contact with a majority of said plurality of springs, said longitudinal members having a breaking load of at least about 35 pounds for a strip having one large longitudinal member and one small longitudinal stabilizing member and said cross-stabilizing members having a breaking load of at least about 75 pounds for a strip having twelve said cross-stabilizing members and cushioning material positioned on top of said plastic support platform.

4,432,110

CUSHIONING STRUCTURE

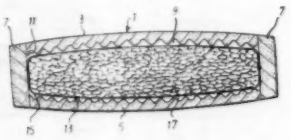
James B. Sutton, Longton, England, assignor to Harrison & Jones (Brookside) Limited, Oldham, England

Filed Jul. 10, 1981, Ser. No. 282,154

Claims priority, application United Kingdom, Jul. 11, 1980, 8022774

Int. Cl.³ A47C *27/22, 27/14*

U.S. Cl. 5—481 **7 Claims**



1. A cushioning structure comprising a flexible foam plastic casing having an internal face which is formed with a finger profile, a stockinette bag received within the casing, and a filling of shredded flexible foam plastic loosely packed within the bag.

4,432,111

PROCEDURE FOR WASHING CLOTHES

Ernst H. Hoffmann, Dortmund, and Hans F. Arendt, Sersheim, both of Fed. Rep. of Germany, assignors to Estel-Hoesch Werke Aktiengesellschaft, Fed. Rep. of Germany

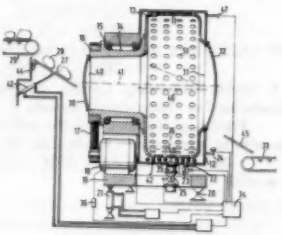
Continuation-in-part of Ser. No. 149,116, May 12, 1980, Pat. No. 4,344,198. This application Jun. 29, 1981, Ser. No. 278,108

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024571; Nov. 8, 1980, 3042198

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ D06F *23/02*

U.S. Cl. 8—158 **14 Claims**



1. Procedure for the washing of textiles through a wash and rinse cycle in a tub-type washing machine with a horizontally arranged tub, in which during the washing and rinsing cycles the tub is driven with a rotational velocity at which the centrifugal velocity at the tub case is between 0.4 and 0.95 g, so that the textiles, during the washing and rinsing cycles, are repeatedly lifted up, and then fall in a trajectory path onto the lower portion of the tub and that between washing and rinsing cycles and after the last rinsing cycle they are spun, characterized in that when the machine is loaded, the tub rotates at a rotational velocity at which the centrifugal velocity at the tub case is 0.2–0.6 g, that washing liquid is constantly supplied until all textiles are wetted with an amount of washing liquid equal to between 45 and 100% of the maximum amount that can be absorbed by the textiles, that following the washing cycle the tub is driven at a certain spin speed until a first amount of washing liquid is completely spun out, then spinning is continued until a further amount of liquid is spun out, that during the subsequent rinsing cycle water is led in in the same manner as washing liquid is led in for the washing cycle, and that the tub

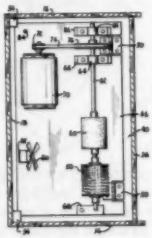
is driven with the same speed during washing, and that after each subsequent rinsing cycle spinning is done in the same manner as after washing.

4,432,112

MACHINE FOR CLEANING SHOE SOLES

Max Muller, 10920 W. 100th Ter., Overland Park, Kans. 66214; Eugene B. Lilly, 4209 W. 104th Ter., Overland Park, Kans. 66207, and Richard E. Bott, R.R. 2, Box 214, Peculiar, Mo. 64078

Filed Nov. 24, 1980, Ser. No. 209,672
Int. Cl.³ A47L *23/22*
U.S. Cl. 15—36 **13 Claims**



1. A machine for cleaning shoe soles comprising:
a frame presenting a foot panel thereon for receiving a shoe sole and a floor panel spaced beneath the foot panel, said foot panel presenting an opening therein;
a platform;
a hinge structure mounting said platform for pivotal movement relative to said floor panel about a generally horizontal hinge axis;
a rotary shoe cleaning element supported for rotation on said platform at a location to extend partially through said opening;
a drive motor on said platform drivingly coupled with said cleaning element to effect rotation thereof, said floor panel and platform being removable from said frame as a unit together with the drive motor and cleaning element on the platform;
a removable back panel on said frame providing access to the floor panel and platform for removal thereof as a unit when the back panel is removed from the frame; and
resilent means urging said platform about said hinge axis in a direction to position said cleaning element in projection through said opening to rotate against a shoe sole for cleaning of same, said resilent means yielding upon application of foot pressure to said cleaning element, thereby permitting depression of the cleaning element into the opening.

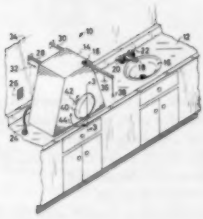
4. A machine for cleaning shoe soles, comprising:
a frame presenting a foot panel thereon for receiving a shoe sole, said panel presenting an opening therein;
a rotary shoe cleaning element supported for rotation on the frame at a location to protrude through said opening in the foot panel;
a two speed motor drivingly coupled with said cleaning element to effect rotation thereof at a relatively low speed when the motor is in a low speed mode of operation and at a relatively high speed when the motor is in a high speed mode of operation;
first electronic audio means for emitting background sound electronically simulating a motor operating at a relatively low speed when said motor is in the low speed mode;
manual switch means for effecting the high speed mode of the motor; and
second electronic audio means for emitting background sound electronically simulating a motor operating at a relatively high speed when said motor is in the high speed mode.

4,432,113

BACK WASHER

Howard W. Gouge, Rte. 1, Box 256, Unicoi, Tenn. 37692

Filed Mar. 8, 1982, Ser. No. 356,112
Int. Cl.³ A61H *33/00*
U.S. Cl. 15—97 R **5 Claims**

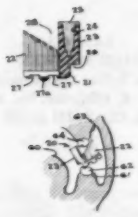


1. Apparatus for providing automatic back washing for a user comprising:
an external electrical power source;
an electrical driving means for receiving electrical power from said external electrical power source and for providing rotational power to a drive shaft;
gearing means having an input connected to said power source drive shaft and an output power shaft extending from a first end to a further end, said gearing means receiving the output rotational power of said electrical drive means and providing selected motion to said output power shaft;
switching means connected between said external electrical power source and said electrical driving means for selectively turning said electrical driving means on and off;
a housing having an upper portion, lower portion and a front face for supporting, containing therein, and protecting said electrical driving means, said gearing means and said switching means, said housing further defining an aperture in said front face to allow said further end of said power shaft of said gearing means to extend through said aperture and external to said housing;
a mounting member detachably connected to said output power shaft such that motion of said power shaft causes a corresponding motion of said mounting member;
padding attached to said mounting member;
an outside cover readily attachable and detachable to and from said padding to allow easy exchange, said automatic back washing apparatus operating to provide movement to said padding and cover to allow said user to place the back against said padding and cover, and thereby wash their back; and
wherein said switching means includes an insulated actuating member external to said housing extending from said front face at said upper portion of said housing to a position readily accessible by said user to allow ready operation of said switching means by said user while said apparatus is actively washing said user's back.

4,432,114
DENTAL-CARE DEVICE AND BRUSH BODY SUITABLE THEREFOR

Johan H. Goudsmit, Rijnsburgerweg 48, 2333 AB Leiden, Netherlands

Continuation-in-part of Ser. No. 81,921, Oct. 4, 1979, Pat. No. 4,346,493. This application Aug. 27, 1982, Ser. No. 412,581
Claims priority, application Netherlands, Oct. 10, 1978, 7810204
Int. Cl.³ B08B 1/00; A46B 9/04
U.S. Cl. 15—104.93 20 Claims

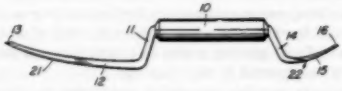


1. A dental care device for insertion entirely within the mouth of a human for effecting a cleaning action by bristles on tooth surfaces by chewing comprising:
(a) a chewable brush body of non-edible pliable, material
(b) said brush body comprising:
(i) a single support body,
(ii) bristles extending from a surface of said support body only substantially in the same direction, and
(iii) a pliable and resilient projection extending from said surface of said support body, adjacent the edge thereof, substantially in the same direction as said bristles,
(c) said brush having such dimensions that it can be inserted entirely into the human mouth and manipulated within the mouth by chewing upon the pliable and resilient projection.

4,432,115
JOINTER FOR COMPACTING AND SMOOTHING MORTAR JOINTS OF MASONRY WALLS

Henry P. Fehler, P.O. Box 194, Wolseley, Saskatchewan, Canada (S0G 5H0)

Filed Jul. 12, 1982, Ser. No. 397,225
Claims priority, application Canada, Feb. 5, 1981, 370148
Int. Cl.³ E04G 21/20
U.S. Cl. 15—105.5 16 Claims

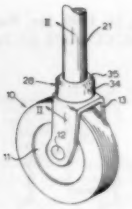


1. A jointer for compacting and smoothing mortar joints of masonry walls, of the type comprising, in combination:
(a) an elongate handle;
(b) a first smoothing trowel portion at one end of said handle and fixedly secured to same;
(c) a second smoothing trowel portion at the other end of said handle and fixedly secured to same;
(d) at least one of said first and second trowel portions having an elongate smoothing surface whose width gradually decreases in the direction away from the respective end of said handle;
(e) said first trowel portion being convexly curved along an arcuate line generally coplanar with the axis of elongation of said handle but offset relative to said axis.

4,432,116
CASTER SHIMMY DAMPER INCLUDING A VISCOUS DAMPING MEDIUM

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Continuation of Ser. No. 251,064, Apr. 6, 1981, abandoned. This application Jul. 19, 1983, Ser. No. 514,852
Int. Cl.³ B60B 33/00
U.S. Cl. 16—35 D 6 Claims



1. In a damper comprising a small diameter axially elongate annular assembly especially useful for attenuating shimmy of a wheelchair caster relative to a caster-supported cylindrical chair leg member to which the caster is mounted for swiveling about a vertical axis:
a first axially extending annular damper portion arranged to engage concentrically about said leg member and having at one end radially inwardly directed means for holding said first annular damper portion fixed against rotation with respect to said leg member;
said first damper portion having an annular axially elongate cylindrical first working surface of substantial axial length and arranged to be coaxial with said axis;
a second axially extending annular damper portion arranged to fit concentrically about said leg member and having at one end radially inwardly directed means for holding said second damper portion fixedly corotative with the caster;
said second damper portion having an annular axially elongate second working surface complementary to and facing toward said first working surface of said first damper portion;
said working surfaces being in narrowly radially spaced apart relation and thereby defining an axially elongated essentially straight working chamber gap having axially opposite ends;
a viscous damping medium in said working chamber gap and providing a viscous shear coupling for yieldably resisting relative rotary movements of said working surfaces;
dynamic sealing ring means carried by and between said damper portions and extending across and sealing said axially opposite ends of said working chamber gap against leakage of said damping medium;
said first annular damper portion comprising an axially extending ring member having opposite ends, and said second damper portion comprising a pair of annular parts one of which is axially elongate and of generally L-shape in cross section and the other of which is a retainer ring, means securing said pair of annular parts corotatively together and defining a cavity which is complementary to said ring member and in which the ring member is received with said working surfaces is opposed relation, and radially extending surfaces of said parts extending across said opposite ends of said gap and also across said opposite ends of said ring member;
said ring member having respective sealing ring grooves at the ends of said first working surface and opening not only toward said second working surface but also toward said radially extending surfaces, and said sealing ring means engaging sealingly in said grooves and projecting from said grooves into sealing engagement with the respective

opposite end portions of said second working surface and also with said radially extending surfaces; and

said retainer ring projecting radially inwardly to underly said ring member and having a radially inwardly opening keying slot within which is adapted to be engaged, as a key, the radially outwardly projecting portion of a set screw carried by the caster for thereby locking said second damper portion corotatively with the caster.

4,432,117

FISH SCALER

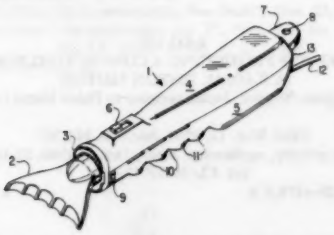
Metro Iskiw, 9511-75 St., Edmonton, Alberta, Canada T6C 2H8

Filed Jan. 25, 1982, Ser. No. 342,183

Claims priority, application Canada, Oct. 8, 1981, 387576

Int. Cl.³ A22C *25/02*

U.S. Cl. 17—66 **5 Claims**



1. A fish scaler comprising a casing having a longitudinal axis; motor means in said casing; shaft means in said casing for driving by said motor means; transmission means in said casing for changing rotary motion of said shaft into longitudinal reciprocating motion along said axis; blade holder means connected to said transmission means; scaling blade means for mounting in said blade holder means, and a scaling edge at the distal end of said blade means extending transverse to said axis, whereby actuation of said motor results in reciprocating motion of said blade means for dislodging fish scales.

4,432,118

SLIVER COILER

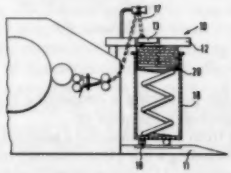
Albert Rosink, Nordhorn, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,674

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110440

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 R **7 Claims**



1. In a sliver coiler including a can having an open top and a central axis; a support for positioning the can in a generally upright orientation; means for rotating said can about said axis on said support; a rotary head having an axis of rotation and guide means arranged eccentrically with respect to said axis of rotation, said central axis of said can being spaced from said axis of rotation of said rotary head, whereby during rotation of said rotary head and said can said rotary head deposits sliver in said can in superposed continuous circular coils being eccentric with respect to said central axis; the improvement comprising adjusting means for altering the angle between said central axis of said can and said axis of rotation of said rotary head for arbitrarily altering the distance between said central axis of said can and said axis of rotation of said rotary head for effecting contact between outer parts of said circular coils and inner wall faces of said can irrespective of the thickness of the sliver deposited in the coiler.

4,432,119

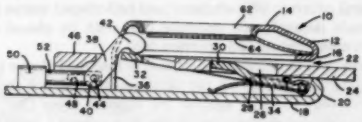
ELECTRICALLY RELEASED SEAT BELT BUCKLE

O. Jay Schwark, Utica, Mich., and Yogendra S. Loomba, Knoxville, Tenn., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 8, 1978, Ser. No. 940,543

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—603 **10 Claims**



1. In a seat belt buckle comprising a housing, an opening in said housing adapted to receive a cooperating tongue having a locking portion, a locking member provided in said housing for locking engagement with said locking portion of said tongue when said tongue is inserted into said opening, and releasing means for releasing said locking member from locking engagement with said locking portion of said tongue, the improvement comprising:

said releasing means being comprised of

(a) an electrically energizable actuator; and

(b) connecting means in contact with said actuator and said locking member, said connecting means being rotatably movable upon energization and deenergization of said actuator;

said locking member being movable in response to movement of said connecting means between a first position at which said locking member is in locking engagement with said locking portion of said tongue and a second position at which said locking member is out of locking engagement with said locking portion of said tongue, said release means being operable to release said locking member following each energization and deenergization of said actuator.

4,432,120

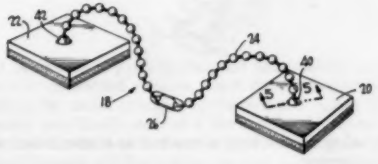
CAP RETAINING DEVICE

Benjamin F. Sherman, Jr., 6329 Mori St., and Samuel Francis, 1202 Perry William Rd., both of McLean, Va. 22101

Filed Aug. 3, 1982, Ser. No. 404,650

Int. Cl.³ B65D *55/16*

U.S. Cl. 24—299 **1 Claim**



1. A cap retaining device for the fuel tank cap of an automobile comprising

a first mounting block (20) adapted to be secured to a fuel tank cap (16),

a second mounting block (22) adapted to be secured to a surface of an automobile (10) adjacent the fuel tank cap (16),

each mounting block (20 and 22) including a support layer (30), a first thin adhesive layer (32) secured to said support layer (30), a layer of resilient foam (34) secured to said first thin adhesive layer (32), a second thin adhesive layer (36) secured to said layer of resilient foam (34) and a paper layer (38) removably secured to said second thin adhesive layer (36), said support layer (30) and said foam layer (34) being permanently secured together as a unit by said first adhesive layer (32),

each support layer (30) having a central aperture (46) and a bell-shaped sleeve (40) therein,

said bell-shaped sleeve (40) having a closed end, an open end and an outer diameter lesser than the diameter of said central aperture (46) whereby said bell-shaped sleeve (40) extends through said aperture (46) with its closed end protruding out of said aperture (46),

an opening in the closed end of said bell-shaped sleeve (40),

an annular flange (48) on the open end of said bell-shaped sleeve (40) abutting against the support layer (30) and being retained thereagainst by the first adhesive layer (32) and by the foam layer (34) bearing against said flange (48) whereby said bell-shaped sleeve (40) and the support layer (30) are permanently connected together,

an elongate flexible bead chain (24) having one end bead permanently disposed in the bell-shaped sleeve (40) on the first mounting block (20) and an opposite end bead permanently disposed in the bell-shaped sleeve (42) on the second mounting block (22),

a splicing link (26) intermediate the ends of said bead chain (24) whereby shortening of said bead chain (24) may be accomplished by cutting several beads therefrom and reconnecting the splicing link (26),

said paper layer (38) on said first mounting block (20) being removed from said second thin adhesive layer (36) which is then adhesively applied to a fuel tank cap (16), and

said paper layer (38) on said second mounting block (22) being removed from said second thin adhesive layer (36) which is then adhesively applied to an automobile surface adjacent the fuel tank cap (16).

4,432,121

SAFETY HOOK OR ELASTIC FASTENING AND SECURING CABLES OF THE SANDOW TYPE

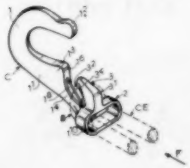
Armand Dupre, Saint.Etienne, France, assignor to Societe Dupre, France

Filed Jun. 18, 1981, Ser. No. 275,112

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 8014580

Int. Cl.³ A44B *13/00*; F16G *11/04*

U.S. Cl. 24—343 **3 Claims**



1. A safety hook which is attached to elastic cables, said hook comprising:

a head forming a hook having a curved portion with an open end, and a lower base portion;

a transverse guide tunnel is located on both sides of said lower base portion and permits the passage of two strands of elastic cable forming a loop; and

anchoring means for holding an elastic cable having a projection part forming a beak having a first central rib which is disposed adjacent to said lower base portion of said head, said beak starts at said lower base portion of said head and extends towards said curved portion of said head whereby said beak defines together with said lower base portion an offset cavity having a progressively widening profile from said lower base portion of said head towards said curved portion of said head, said cavity has successive contiguous zones with a more reduced section to assure proper positioning and pinching by crimping of an elastic cable held thereon, the lower base portion of said head is provided with a second central rib which together with said first central rib of said beak assures pinching of elastic cable held in the offset cavity.

4,432,122

METHOD FOR PRODUCING A CONNECTING ROD FOR A RADIAL PISTON MOTOR

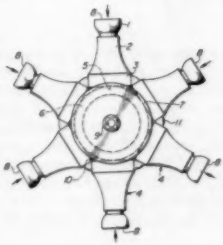
Yoshio Iijima, Nagoya, Japan, assignor to Daido Metal Co. Ltd., Japan

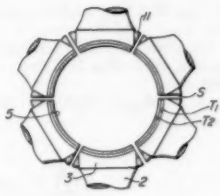
Filed Mar. 11, 1981, Ser. No. 242,767

Claims priority, application Japan, Oct. 8, 1980, 55-141779

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—156.5 A **4 Claims**





1. A method for producing a connecting rod for a radial piston motor, comprising the steps of:

(A) producing from a steel material a plurality of blanks (4), each blank including a one piece structure having a spherical surface portion (1), a rod portion (2) and a pad portion (3) having a planar sliding surface (5);

(B) producing a ring-shaped blank (12) by means of assembling a plurality of said blanks (4) in a ring form and joining them at joints (10) by welding (11);

(C) machining said planar sliding surfaces (5) of said pad portions (3) in said ring-shaped blank (12) to form curved sliding surfaces;

(D) applying by centrifugal casting a bearing alloy (13) onto said machined, curved sliding surfaces;

(E) machining the surface of said bearing alloy applied by centrifugal casting; and

(F) dividing said ring-shaped blank (12) at said joints (10) formed by said welding (11).

4,432,123

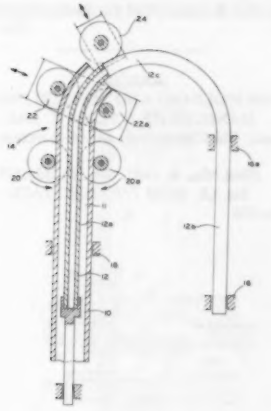
PROCESS FOR THE MANUFACTURE OF DOUBLE WALLED PIPE

Rudolf Minning, Dortmund, and Heribert Dierkes, Hagen, both of Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 94,647, Nov. 15, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,192

Int. Cl.³ B21D *21/00, 9/10, 53/06*

U.S. Cl. 29—157 A 4 Claims



1. A process for manufacturing an elbow-shaped double pipe having an inner rigid pipe generally concentrically spaced from an outer rigid pipe to define a hollow space extending between the inner and outer pipes, comprising the steps of:

(a) providing a prebent inner rigid pipe having a straight shank portion extending from each end of a bent elbow portion;

(b) providing a straight section of outer rigid pipe;

(c) supporting the prebent inner rigid pipe in a pipe bending apparatus by gripping one straight shank portion of the inner pipe with the elements of the pipe bending apparatus so that the center of curvature of the bent elbow portion of the inner pipe is congruent with the center of curvature of the bending element of the pipe bending apparatus;

(d) slipping one end of the straight section of outer pipe over the other straight shank portion of the inner pipe;

(e) supporting the straight section of outer pipe in the pipe bending apparatus in generally concentric, hollow spaced relationship with the other straight shank portion of the inner pipe; and

(f) advancing the outer pipe further onto the inner pipe and into the pipe bending apparatus and contacting only the exterior of the outer pipe with the pipe bending apparatus as the pipe bending apparatus bends the outer pipe around the bent elbow portion of the inner pipe while maintaining a generally concentric, hollow spaced relationship between the inner and outer pipes thereby forming an elbow-shaped double wall pipe.

4,432,124

MARKER RING INSTALLATION TOOL

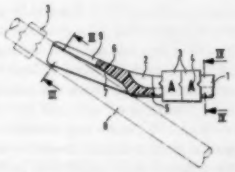
Manfred O. Breuers, Rödermark, Fed. Rep. of Germany, assignor to Idento-Gesellschaft für Industrielle Kennzeichnung mbH, Rödermark, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,174

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3031987

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 3 Claims



1. A marker ring installation tool for applying resilient split rings provided with marking signs onto electrical wires, comprising a supply rod for supporting a series of marking rings, a flared contact shoe formed at one end of the rod and having a front side of a width which exceeds the diameter of the rod and a bottom recess communicating with the free end of the shoe and converging toward the rod for engaging wires of different diameters, and an elongated notch formed at the front side and communicating with the free end of the shoe to split the latter in the range of said recess into a flexible fork-like configuration suitable for resiliently adjusting the shoe to wires of different diameters.

4,432,125

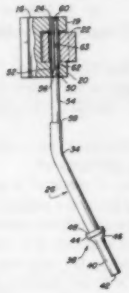
HINGE PIN REMOVAL TOOL

Nick Monteleone, 1142 Centoni Dr., Lake Zurich, Ill. 60047; Jerry Monteleone, 4840 N. Greenwood, Norridge, Ill. 60615, and Lorenzo Monteleone, 808 Roppolo Dr., Elk Grove Village, Ill. 60007

Continuation of Ser. No. 282,411, Jul. 13, 1981. This application May 26, 1983, Ser. No. 498,393

Int. Cl.³ B22D *19/10;* B23P *19/04*

U.S. Cl. 29—402.08 1 Claim



1. A method of disassembling and subsequently assembling doors to automotive vehicles, which doors are secured to said vehicles by means of hinges having first and second mutually parallel ears fixedly secured to the body of the vehicle and a third ear fixedly attached to the door and adapted to be disposed between said first and second ears, a longitudinally split, tubular hinge pin being compressed near its respective ends in mutually aligned holes in said ears and loosely extending through a hole in said third ear, said last mentioned hole being

aligned with said holes in said first and second ears when said door is assembled to said vehicle, comprising the steps of

providing a unitary rigid metal members having elongated, enlarged attachment means at one end for reception in the chuck of a fluid operated impact device, said member having at its other end a short pilot projection having an external diameter which slidably fits into said spring pin when said spring pin is compressed in said openings, said member having adjacent to said pilot projection a rectilinear, cylindrical portion having an external diameter which slidably fits into said openings and is greater than the internal diameter of said spring pin when said spring pin is compressed in said openings thereby to provide an annular shoulder adjacent said pilot projection for engaging an end of said spring pin, said member having a bend between said attachment means and said cylindrical portion such that the included angle between the principal longitudinal axes of said cylindrical portion and said attachment is no more than about 150°, and a stop shoulder on said rectilinear, cylindrical portion facing toward said pilot projection to limit the distance said cylindrical portion is insertable into said first or second ears, said stop shoulder being spaced from said annular shoulder by a distance less than the combined lengths of said holes,

attaching said attachment means to a fluid operated impact device,

inserting said pilot projection into the one end of said spring pin adjacent said first ear,

energizing said impact device while pressing said annular shoulder against said one end of said spring pin to push said spring pin completely through said first and third ears to press said stop shoulder against said first ear,

removing said rigid metal member from between said first and second ears and then removing said door from said vehicle without removing said spring pin from said second ear,

subsequently assembling said door to said vehicle with said third ear positioned between said first and second ears with said holes in said ears in mutual alignment, and

pushing said spring pin through said hole in said third ear into said hole in said first ear.

4,432,126

METHOD OF AND APPARATUS FOR MANUFACTURING SLIDE FASTENER COUPLING ELEMENTS

Sadanobu Sugahara, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,144

Claims priority, application Japan, Dec. 29, 1981, 56-215060

Int. Cl.³ B21D *53/52;* **A41H** *37/06*

U.S. Cl. 29—410 **8 Claims**

1. A method of manufacturing coupling elements for a slide fastener, comprising the steps of:

(a) providing a rod of metal of a generally Y-shaped cross section having a base, as a prospective coupling head, and a pair of legs divergently extending from the base;

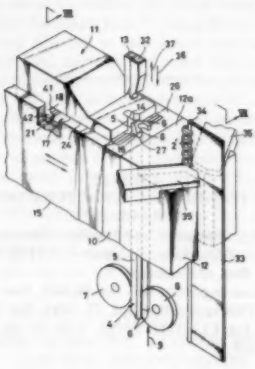
(b) feeding the rod stepwise in a longitudinal direction;

(c) transversely slicing the rod into a plurality of coupling element blanks in timed relation to said stepwise feeding;

(d) placing the coupling element blanks, one at a time, in a coupling-head forming station remote from the rod in a direction perpendicular to said longitudinal direction;

(e) forming a chamfered portion on the base of the rod each time each coupling element blank is sliced off from the rod and then placed in said coupling-head forming station, each coupling element blank thus having a chamfered base; and

(f) at said coupling-head forming station, forming the base of each coupling element blank into a final coupling head of one coupling element which head has a projection from one face and a coacting socket in the other face at such a



position that the chamfered portion is disposed around the socket.

4,432,127

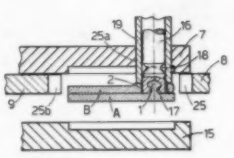
PROCESS OF MOLDING AND ASSEMBLING A PAIR OF HANDLES OF A PLASTIC BAG

Mauro Diazzi, Via Chiesa Sud, 243/A-Rovereto sul Secchia, Italy

Filed Mar. 8, 1982, Ser. No. 356,107

Int. Cl.³ B28B *7/10;* **B29C** *27/00*

U.S. Cl. 29—436 **3 Claims**



1. A method for automatically molding, assembling and expelling two separate plastic handles provided with snap interlockable male and female fastener means respectively on facing surfaces thereof adapted to be connected to a plastic bag, comprising the steps of molding at least a pair of substantially identical handles each provided with respective male and female interlockable fastener means in first and second molding cavities respectively, the molding cavities being in spaced apart face-to-face relationship and while the molding cavities are closed by intervening reciprocatory plates, and while a plurality of spaced means to shape the interlockable male and female fastener means is extending through the first molding cavity, between opposing ends of said plates and is terminated substantially at the second molding cavity, each last-named means to shape having an end cavity formed to shape the male fastener means and being in communication with the second molding cavity and also having an annular recess formed to shape the female fastener means and being in communication with the first molding cavity, the axes of said means to shape being parallel and being across a plane common to the reciprocatory plates and the first and second molding cavities, said molding of the handles consisting of injecting plastic material into said first and second molding cavities and curing the injected plastic material therein, opening the first and second spaced apart molding cavities by separating the opposing ends of the intervening reciprocatory plates, stripping the handle having the male fastener means out of the second molding

cavity by withdrawal of all of the spaced means to shape and thereby moving such handle toward the facing handle remaining in the first molding cavity and causing snap interlocking of the male and female fastener means of the two handles with the latter in face-to-face contact, and separating the means to shape from the two united handles.

4,432,128

METHOD AND SYSTEM FOR INSTALLING A LAYERED VESSEL ON LOCATION

Raymond E. Pechacek, and Eugene J. Clay, both of Houston, Tex., assignors to Hahn & Clay, Houston, Tex.

Filed Nov. 24, 1980, Ser. No. 209,846
Int. Cl.³ B21D *39/03;* E04G *3/00;* B23K *31/02*
U.S. Cl. 29—429 **10 Claims**

1. Method of construction of a layered vessel on final location, comprising:

construction of a bottom head section and mounting of said bottom head section on a vessel foundation;

erection of a generally cylindrical construction frame about said bottom head, said construction frame extending upwardly to substantially the height of the vessel to be constructed;

providing with said construction frame a plurality of vertically spaced, annular work stations;

substantially simultaneously with erection of said cylindrical construction frame, constructing onto said bottom head a cylindrical shell liner and a hemispherical inside, top head liner mounted on said cylindrical shell liner;

utilizing said annular work stations, initiating construction of said shell layers by welding in place a plurality of curved plates from the bottom head upwardly;

adding layers of such curved plates to said shell from the bottom head upwardly with the addition of such layers occurring substantially simultaneously at various of said annular work stations, with each additional layer being started at said shell portion adjacent to said bottom head; and

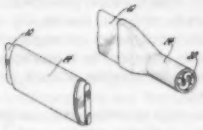
continuing some of said layers as they are completed on said shell onto said top head by the addition of layers of gores thereto.

4,432,129

METHOD OF TERMINATING A LIGHT CONDUCTIVE RIBBON

Wendell P. Featsent, Hubbard, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 25, 1982, Ser. No. 342,185
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—447 **4 Claims**



1. A method of terminating the end of a solid light conductive ribbon comprising the steps of

positioning a length of heat shrink tubing over the end of the ribbon,

forming the end of the ribbon into a generally cylindrical form by heating the end of the ribbon and the heat shrink tubing to soften the ribbon and to shrink at least an end of the tubing thereby constricting the end of the ribbon into cylindrical form, and then

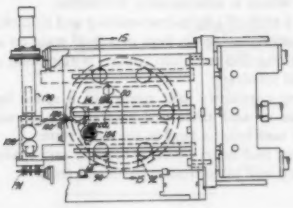
installing a generally cylindrical tubular ferrule over the cylindrically formed ribbon end whereby the heat shrink tubing serves as a protective liner between the ferrule and the ribbon.

4,432,130

SIX STATION BROACHING MACHINE

Leonard A. Gabriele, Warren, Mich., assignor to Lear Siegler, Inc., Calif.

Filed Jul. 20, 1981, Ser. No. 285,052
Int. Cl.³ B23Q *39/04;* B23D *37/06*
U.S. Cl. 29—563 **11 Claims**



1. A machine tool for machining a plurality of relatively angularly disposed surfaces on each of a plurality of identical workpieces in a succession of identical repeated machine cycles, which comprises:

a stationary frame,

a rotatable table,

index mechanism for successively rotatively indexing said table about an axis in predetermined equal steps such that said table completes exactly 360° rotation in a predetermined number of index rotations,

a plurality of machining mechanism mounted on said frame for rectilinear traverse relative to said table in identical

parallel forward machining strokes perpendicular to the axis of said table and return idle strokes,

a plurality of work holders on said table each effective to clamp a workpiece on said table in fixed relation thereto, said work holders being equally spaced radially from the axis of rotation of said table and equally angularly spaced thereon,

each of said machining mechanisms comprising means for machining surfaces at each traverse stroke on a plurality of workpieces which are perpendicular to the axis of the table but which surfaces, due to the different indexed positions of the workpieces, are angularly positioned with respect to each other on each workpiece by an amount related to the index rotation of each workpiece between successive cuts,

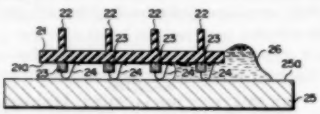
means for alternately actuating said machining mechanisms in rectilinear machining strokes and for actuating said index mechanism in repeated cycles to machine surfaces of said workpieces at each cycle which are angularly disposed to surfaces machined during a contiguous cycle.

4,432,131

METHOD FOR MANUFACTURING DISPLAY DEVICE

Tetsuo Sadamasa, Kawasaki, and Osamu Ichikawa, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1982, Ser. No. 414,897
Claims priority, application Japan, Sep. 22, 1981, 56-148835
Int. Cl.³ H01L *33/00*
U.S. Cl. 29—569 L **18 Claims**



1. A method for manufacturing a display device, comprising the steps of:

disposing a substrate having a surface on which a plurality of light-emitting diodes are two-dimensionally aligned such that said surface of said substrate opposes a surface of a table which is substantially horizontal;

placing a resin of a light-transmitting and electrically insulating material which is kept in a fluid state on said table so as to bring said resin into contact with at least one side end of said substrate;

filling by capillarity said resin into a space between said surface of said table and said surface of said substrate while said resin is kept in the fluid state;

hardening said resin which is filled in said space; and

removing said table from a hardened resin.

4,432,132

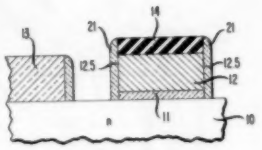
FORMATION OF SIDEWALL OXIDE LAYERS BY REACTIVE OXYGEN ION ETCHING TO DEFINE SUBMICRON FEATURES

Eliezer Kinsbron, Highland Park, and William T. Lynch, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1981, Ser. No. 328,368
Int. Cl.³ H01L *21/42, 21/423;* C23C *15/00*
U.S. Cl. 29—571 **16 Claims**

1. A method for fabricating a semiconductor structure comprising the steps of forming, overlying a horizontal surface in a structure, a patterned layer having a vertical sidewall at the bottom of which is located an exposed surface of a first layer of first material, said first material containing atoms of a first kind, and forming on the vertical sidewall a masking layer of predetermined submicron horizontal thickness dimension, and using the masking layer to define a feature of the structure underlying the masking layer,

the masking layer being formed by bombarding said horizontal surface portion with oxygen for a predetermined time to react with atoms of said first material, located at the



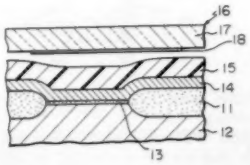
exposed surface of the first layer, whereby the masking layer, comprising a chemical compound of oxygen and said atoms, is deposited on the vertical sidewall to the predetermined submicron thickness, and whereby the thickness of the first layer is reduced.

4,432,133

METHOD OF PRODUCING A FIELD EFFECT TRANSISTOR

Toshikazu Furuya, Kawasaki, Japan, assignor to Fjuitsu Limited, Kawasaki, Japan

Filed Aug. 10, 1982, Ser. No. 406,978
Int. Cl.³ H01L *21/265, 21/28*
U.S. Cl. 29—571 **9 Claims**



1. A method of producing a field effect transistor including a semiconductor substrate having an active region with a middle portion and end portions, and a field region, comprising the steps of:

(a) forming a thick insulating layer on the field region of the semiconductor substrate, the thick insulating layer having an inclined surface and surrounding the active region of the semiconductor substrate;

(b) forming a thin insulating layer on the active region of the semiconductor substrate;

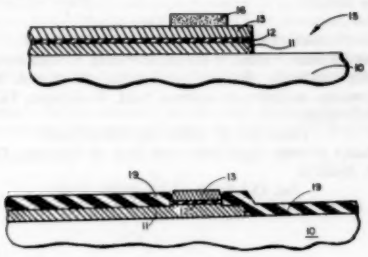
(c) forming a gate electrode on the thin and thick insulating layers, the gate electrode formed on a portion of the thin insulating layer and extending onto the thick insulating layer, and having first portions and a second portion, the first portions lying above the end portions of the active region and having a larger width than of the second portion lying above the middle portion of the active region; and

(d) forming a source region and a drain region in the active region by selectively introducing impurities into the active region.

4,432,134
PROCESS FOR IN-SITU FORMATION OF NIOBIUM-INSULATOR-NIOBIUM JOSEPHSON TUNNEL JUNCTION DEVICES

Addison B. Jones, Yorba Linda, and Francis M. Erdmann, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1982, Ser. No. 376,483
Int. Cl.³ H01L *39/24, 39/22*
U.S. Cl. 29—578 **10 Claims**

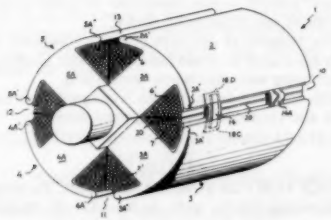


1. A method of forming a superconductor-barrier-superconductor junction device comprising the steps of:
depositing a first superconductive layer on a substrate;
forming a barrier layer on said first superconductive layer;
depositing a superconductive layer on said barrier layer;
depositing a layer of photoresist over said second superconductive layer;
patterning said layer of photoresist to form a mask;
etching said second superconductive layer, said barrier layer, and a small portion of said first superconductive layer using said layer of photoresist as a mask to form a mesa structure;
depositing a dielectric layer over said mesa structure; and
dissolving said photoresist layer, thereby lifting off the portion of said dielectric layer overlying said second superconductive layer.

4,432,135
METHOD OF LOCKING CONDUCTORS IN A DYNAMOELECTRIC MACHINE ROTOR

Paul W. Greenlee, Hendersonville, Tenn., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 965,034, Nov. 30, 1978. This application Sep. 24, 1982, Ser. No. 423,417
Int. Cl.³ H02K *15/10*
U.S. Cl. 29—598 **1 Claim**

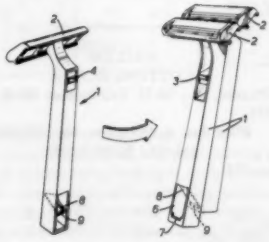


1. A method of locking coiled conductors in a slot of a dynamoelectric machine rotor that has a plurality of slots defined respectively by adjacent salient poles of the rotor, each of said poles having a tip portion the extremities of which extend generally perpendicular to, and beyond, opposite sides of the outer end of a shank portion of the pole, which method comprises the steps of:
(1) placing one of a plurality of sheets of insulating paper, respectively, between the pole surfaces defining each of said slots and the coiled conductors disposed therein, before the locking members described below are placed over said conductors,
(2) providing each of said sheets of insulating paper with tabs that extend, respectively, over the part of the coiled conductors located beneath said locking members when they are placed as described below in step (4), thereby to insulate the locking members from the conductors while leaving a major part of the outer coils of the conductors uncovered by said sheets of insulating paper,
(3) providing a plurality of generally V-shaped, stiff, deformable locking members and bending the ends of each of said locking members outward before the locking members are placed over said conductors thereby to position the bent portions of the locking members against said insulating paper while the outermost ends of the locking members are driven into engagement with the pole tip portions,
(4) placing at least one of said generally V-shaped, stiff, deformable locking members over a plurality of said coiled conductors disposed within said slot, the ends of each of said locking members being placed closer than the base thereof to the conductors, and
(5) forcing each locking member into a generally flat configuration to drive its ends under the extremities of the pole tip portions disposed on opposite sides thereof, thereby to secure the respective ends of each locking member under the pole tip portions adjacent thereto and to position substantially the entire length of each locking member snugly against the outermost coiled conductors within the slot beneath it.

4,432,136
RAZOR AND HANDLE COUPLING MEANS

John B. Taylor, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Jun. 11, 1982, Ser. No. 387,584
Claims priority, application United Kingdom, Jun. 22, 1981, 8119146
Int. Cl.³ B26B *21/00*
U.S. Cl. 30—32 **3 Claims**



1. A disposable safety razor comprising an elongated handle and a shaving head coupled to the top of said elongated handle, said elongated handle adapted for secure but releasable engagement with an identical adjacent razor handle, said handle including front and back faces, a first, upwardly directed hook formed on one of said faces, and a second, downwardly directed hook formed on the other of said faces, and also including a resilient latch member formed on one of said faces and a ledge formed on the other of said faces spaced along said handle from said hooks, and wherein said handle and said adjacent handle are releasably secured together by interengagement of said first hook of said handle with said second

hook of said adjacent handle, and engagement of said latch member of said handle with said ledge of said adjacent handle, said latch member being yieldable to permit separation of said handles.

4,432,137

ROTARY CUTTER

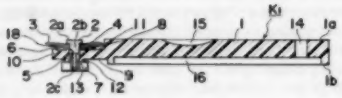
Yoshio Okada, Osaka, Japan, assignor to Okada Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1982, Ser. No. 408,718

Claims priority, application Japan, Sep. 29, 1981, 56-145180[U]

Int. Cl.³ B26B *29/00*

U.S. Cl. 30—292 **15 Claims**



1. A rotary cutter comprising:

an elongated handle having an aperture extending through one end thereof;

said handle being formed with a bearing projection coaxial with said aperture;

a shaft having a head portion at one end thereof, which extends through said aperture so as to be supported by said handle;

a disc blade having a central opening, which is rotatably mounted on said shaft in a plane perpendicular to the longitudinal axis of said shaft with said shaft extending through said central opening so that said disc blade may be caused to roll on a material to be cut during a cutting operation;

said disc blade being interposed between said head portion and said bearing projection, said bearing projection and said head portion respectively bearing on said disc blade at radially spaced locations on opposite sides of said disc blade; and

a fastening member engagable with said shaft for urging said head portion against said disc blade so as to urge said disc blade against said bearing projection, whereby said disc blade is subjected to curved elastic deformation between said radially spaced locations and is caused to rotate in the curved state.

4,432,138

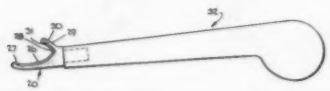
CUTTING BLADE

Albert V. Piccolo, Jr., 70-25 Yellowstone Blvd., Forest Hills, N.Y. 11376

Filed Jun. 4, 1982, Ser. No. 385,084

Int. Cl.³ B26B *29/00*

U.S. Cl. 30—294 **3 Claims**



1. A hand-held cutter for cutting a cover from a roller comprising:

a handle;

a cutting blade having a longitudinally extending bottom edge portion, an upwardly curved front bottom edge portion extending forwardly of said longitudinally extending bottom edge portion, a convexly curved front tip portion, a concavely curved upwardly extending cutting edge portion, and a longitudinally extending rear portion set in said handle, said cutting blade including an upper portion extending forwardly and upwardly from the upper region of said upwardly extending cutting edge portion and having a downwardly extending concavely curved cutting edge portion which joins said upwardly extending cutting edge portion and which extends upwardly from the uppermost region of said longitudinally extending rear portion a distance equal to approximately one-third the maximum height of said uppermost portion of said longitudinally extending rear portion.

4,432,139

SAFETY DEVICE ON A POWER SAW

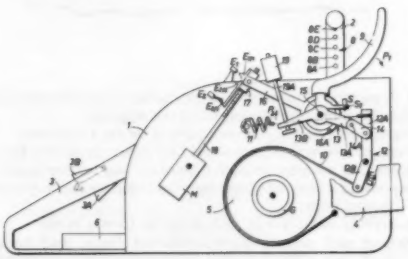
Gisbert Köhler, Fellbach; Hermann Weiss, Grossbottwar, and Götz Landwehr, Berglen-Rettersburg, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,487

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040516

Int. Cl.³ B27B *17/02;* **B27G** *19/00*

U.S. Cl. 30—381 **24 Claims**



1. A safety device for a power saw which has a housing to which are attached two handles, and also has an engine, a cutting tool, a drive member associated with said engine and said cutting tool, and a brake which in its operative position engages said drive member under the effect of a spring or other force retainer to stop the movement of said cutting tool, said safety device comprising:

a stop associated with said housing for holding said brake in an inoperative position while said stop is in a locked position:

an adjustment device associated with said housing and said stop for releasing the latter from its locked position when said adjustment device is actuated;

an energy source, associated with said housing and energized by said saw engine, for driving said adjustment device;

an electric control device, associated with said housing for controlling said adjustment device;

operating elements in the form of contact switches respectively associated with said handles and said control device for actuating said adjustment device; and,

a drivable resetting device which is coupled with said stop and is also controlled by said control device.

4,432,140

DEVICE FOR COPYING PANORAMIC IMAGES

Tomas Santamaria Ulecia, Avda. de Bruselas, 58, Madrid - 28, Spain

Filed Mar. 11, 1982, Ser. No. 357,320

Claims priority, application Spain, Mar. 24, 1981, 257.100

Int. Cl.³ B43L *13/16*

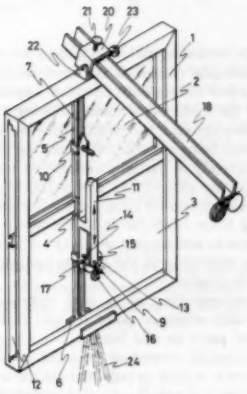
U.S. Cl. 33—20 C **11 Claims**

1. An apparatus for copying panoramic images, said apparatus comprising:

a frame member defining a screen including a first section having a surface for imaging a panoramic image to be copied and a second section having means forming a surface for supporting a copy of the image, said first and second sections being separated by means extending longitudinally in a first direction;

a longitudinal ruler member extending in a second direction transverse to said first direction, said ruler member having opposite ends spaced in said second direction and slidably mounted on said frame member, each said end having means for enabling said ruler member to be slidable with respect to said frame member in said first direction, while maintaining the alignment of said ruler member extending in said second direction, and said ruler member having therein a longitudinal slot extending in said second direction;

a transfer member mounted on said ruler member for sliding movement with respect thereto in said second direction,



said transfer member having first and second ends spaced from each other in said second direction;

a tracking point fixed to said first end of said transfer member and adapted to trace along an image imaged on said surface of said first section;

a writing point fixed to said second end of said transfer member and adapted to write on said surface of said second section;

said tracking point and said writing point being spaced from each other in said second direction by a distance substantially equal to the dimension in said second direction of either of said first or second sections; and

means, integral with said transfer member, for enabling said transfer member and thereby said ruler member to be moved over said screen, thereby moving said tracking point along the image on said surface of said first section and correspondingly moving said writing point along said surface of said second section, and thereby copying thereon the image.

4,432,141

HIGH PRECISION HEIGHT COMPARATOR APPARATUS

Stanley T. Marcyan, 515 W. Windsor Rd., Glendale, Calif. 91204

Filed Jun. 3, 1983, Ser. No. 500,937

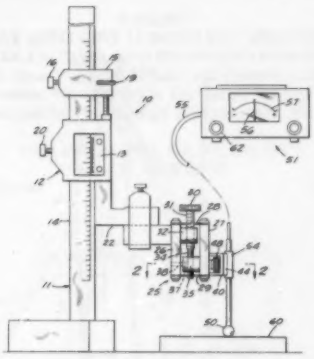
Int. Cl.³ G01B *7/14*

U.S. Cl. 33—169 R **9 Claims**

1. A self-contained unitary micro-adjuster for supporting a precision height sensor while in use to compare the height of a specimen surface with the height of a Johannson block, or the like, and comprising in combination:

first and second elongated rigid members held flexibly interconnected in spaced apart parallel relation by a pair of parallel leaf springs secured to a respective pair of ends of said rigid members;

said first rigid member having a rigid support extending therefrom and adapted to be clamped immovably to the adjustable carriage of a transfer stand;



said second rigid member having means for rigidly clamping a height sensor thereto; and

manually adjustable differential screw means supported between and parallel to said first and second members with the threads at the opposite ends thereof mateable with threaded bores through means rigidly fixed to a respective one of said first and second members.

4,432,142

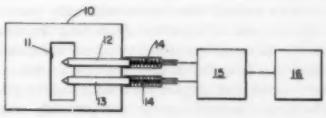
KEY CODE

Andrew J. Korsak, Redwood City, Calif., assignor to All-Lock Electronics, Inc., North Brunswick, N.J.

Filed Feb. 26, 1982, Ser. No. 352,547

Int. Cl.³ G01B *7/00*; E05B *35/04*

U.S. Cl. 33—174 F **3 Claims**



1. A key reading system comprising:

a key having a plurality of rows, each row having a plurality of reading positions along its length, each reading position in one row cooperating with a reading position in each other row to form a cooperating set of reading positions, there being a plurality of such sets along the length of the key,

each reading position being constructed with either a first physical characteristic or a second physical characteristic, except that no one of said sets has only second physical characteristics at every one of its reading positions,

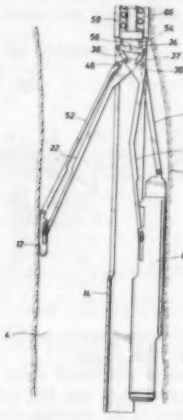
a key reading apparatus having reading means for reading the physical characteristics of the reading positions of each of said sets, taken in succession from the first set to the last set, said reading means including a clock line means for distinguishing the presence of each set at the reading means, said clock line means being responsive to distinguish the presence of a set, in response to a reading of any combination of first or second physical characteristics except all second physical characteristics.

4,432,143

WELL LOGGING APPARATUS

Keith A. Moriarty, and Lowell R. Milligan, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 22, 1982, Ser. No. 360,747
Int. Cl.³ G01B 7/12; G01V 5/00
U.S. Cl. 33—178 F 9 Claims



1. A well logging instrument for use in an earth borehole, comprising:

an elongated body member adapted to traverse said borehole;

a first crank arm pivotally attached intermediate the ends thereof to a first location on said body member;

a second crank arm pivotally attached intermediate the ends thereof to a second location on said body member;

a first contact pad adapted for contacting the sidewalls of said borehole, said first contact pad pivotally and slidably attached to a first end of said first crank arm;

a second contact pad adapted for contacting the sidewalls of said borehole, said second contact pad pivotally and slidably attached to a first end of said second crank arm;

a first support arm having a first end pivotally attached to said first contact pad and a second end pivotally attached to said first location on said body member;

a second support arm having a first end pivotally attached to said second contact pad and a second end pivotally attached to said second location on said body member;

a first coupling link having a first end pivotally attached to a second end of said first crank arm;

a second coupling link having a first end pivotally attached to a second end of said second crank arm;

a drive link pivotally attached proximate its ends to the second ends of said first and second coupling links;

a piston attached to said drive link;

drive means for causing said piston to move longitudinally within said body member whereby said first and second contact pads are generally laterally extended relative to aid body member; and

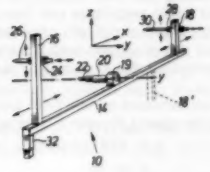
retraction means for causing said piston to move longitudinally within said body member such that said first and second contact pads are generally laterally retracted relative to said body member.

4,432,144

ARRANGEMENT FOR MEASURING AND CHECKING MOTORCYCLE FRAMES

Harry Carlsson, Köping, Sweden, assignor to AB Samefa, Kungsoer, Sweden

Filed Feb. 22, 1982, Ser. No. 350,833
Claims priority, application Sweden, Mar. 12, 1981, 8101597
Int. Cl.³ G01B 5/25
U.S. Cl. 33—180 AT 12 Claims



1. Apparatus including an arrangement for measuring and checking motorcycle frames of the kind incorporating structure defining a pair of reference points on opposite sides of the lower part of the motorcycle frame defining a reference axis (y—y) extending through the width of the motorcycle frame, said arrangement being suitable for measuring both a motorcycle frame completely or partially exposed by removal of other components of the motorcycle and a frame of a complete motorcycle, said measuring arrangement comprising:

a measuring beam connectable to the motorcycle frame at right-angles to said reference axis (y—y) with the measuring beam extending in the longitudinal direction of the motorcycle frame;

fixing means extending along said reference axis (y—y) between said reference point on said motorcycle frame and a fixed point on said beam;

at least one upright extending from the measuring beam at right-angles to a plane parallel to both the measuring beam and the reference axis (y—y), said upright being mounted for displacement (x) so that it can be moved along the beam;

at least one mounting member mounted for displacement (z) along the upright;

a measuring point displaceable in the mounting member at right-angles to both the measuring beam and the upright, with calibrations on at least the measuring beam and the upright for determining the amount of the displacement (x) of the upright along the beam in relation to the reference axis (y—y) and also the displacement (z) of the measuring point along the upright in relation to the measuring beam, and thus also the perpendicular distance of the measuring point from the reference axis (y—y).

4,432,145

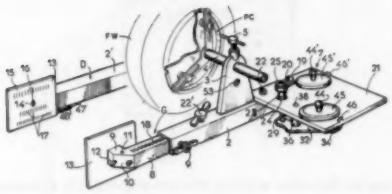
APPARATUS FOR INSPECTING THE GEOMETRY OF THE WHEELS OF A VEHICLE

Yves Caroff, Saint Mande, France, assignor to Facom, Morangis, France

Filed Nov. 20, 1981, Ser. No. 323,255
Claims priority, application France, Nov. 21, 1980, 80 24762
Int. Cl.³ G01B 11/275
U.S. Cl. 33—288 9 Claims

1. An apparatus for inspecting the geometry of wheels of a vehicle, comprising, in combination, two measuring devices adapted to be fixed respectively to two front wheels of the vehicle and which, in use, have a generally symmetrical shape with respect to each other, each of said devices comprising in combination a first hollow tubular rigid bar, a projector carrier adapted to be mounted on one of said front wheels, means for fixing the bar to the projector carrier whereby said bar extends substantially parallel to said wheel, means inside the bar for projecting a beam of light longitudinally of the bar, a unit

disposed at one of the bar and comprising a screen, a mirror rigid with the screen and disposed in such manner as to reflect said beam and project said beam transversally of the apparatus toward the screen pertaining to the opposite device of said two devices, said apparatus further comprising, on at least one of said devices, a second tubular bar having one end portion telescopically and slidably mounted in said first bar so that the second bar is movable toward and away from said fixing



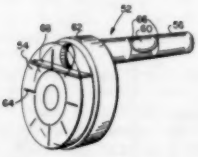
means, a locking means for arresting telescopic movement of said second bar in said first bar, said unit comprising the mirror and the screen being mounted on the second bar adjacent an end of the second bar opposed to said one end portion, whereby relative telescopic movement of said first and second bars allows for compensation of set-back of the rear wheels of said vehicle, the apparatus further comprising means on each of said devices for receiving a sub-assembly for inspecting the kingpin inclination and the castor angle of the vehicle wheels.

4,432,146

INTEGRATED DRILL LEVELING APPARATUS

Albert M. Klein, 96 Harmony Ave., East Keansburg, N.J. 07734

Filed May 26, 1983, Ser. No. 498,550
Int. Cl.³ G01C *9/28*
U.S. Cl. 33—334 **2 Claims**



1. An integrated drill leveling apparatus comprising:

a bi-directional orienting means attachable to said drill for simultaneously assisting in the leveling of said drill in two orthogonal directions, said bi-directional leveling means comprising a circular bubble-type level, said circular level including a convex interior cavity which is tapered so as to be wider in the center of said circular level and thinner near the edges thereof;

further leveling means attached to the periphery of said circular level for determining the orientation of said drill in a direction perpendicular to the two orthogonal directions determined by said circular level, said further leveling means comprising a tubular type level, said tubular type level including a cavity that is tapered so as to be wider near the center thereof and thinner near the ends thereof with one of said ends being closed and the other end being open, the open end of said tubular cavity and the cavity of said circular level communicating with each other so as to form a continuous cavity;

liquid means housed within said continuous cavity;

bubble means carried by said liquid means and also housed within said continuous cavity, and

barrier means in said cavity of said circular level located adjacent the point of communication of said cavities for preventing said bubble means from escaping into said tubular level when said circular level is inverted so that said tubular level points upwards away from the earth,

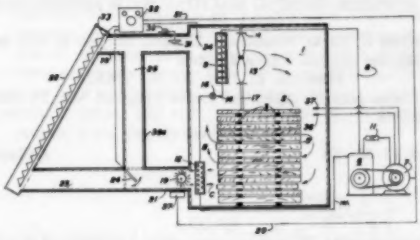
wherein said integrated level measures orientations in three mutually orthogonal directions.

4,432,147

ENERGY EFFICIENT LUMBER DRY KILN USING SOLAR COLLECTORS AND REFRIGERATION SYSTEM

Peter Y. S. Chen; Wayne A. Helmer, and Howard N. Rosen, all of Carbondale, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 24, 1981, Ser. No. 276,764
Int. Cl.³ F26B *21/08*
U.S. Cl. 34—46 **13 Claims**



1. Apparatus to control temperature and humidity in drying selected material, including a chamber to receive the material to be dried, a refrigeration system having a refrigerant compressor, evaporator means and a condenser where the condenser is disposed within the chamber, blower means to circulate air from the condenser over and through the material to be dried, first conduit means communicating with the chamber and providing a flow path for a portion of the air passing over the material to be dried where the evaporator means is disposed to receive at least a portion of the air flowing through the first conduit, solar cell means to receive radiant heat and having an inlet communicating with the first conduit and an outlet communicating with the chamber, a duct directly connecting the chamber to the outlet of the solar cell means to convey heated air from the solar cell means directly to the chamber, second conduit means having an inlet communicating with the first conduit and an outlet communicating with the chamber, damper means downstream from said evaporator means to selectively direct air flowing from the first conduit to the second conduit and to the solar cell means, and fan means to supply air from the chamber to the first conduit.

4,432,148

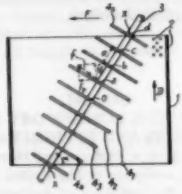
CONTINUOUSLY OPERATING HYDRO-EXTRACTOR

Luc Darbonne, Le Prieure, Oncy sur Ecole, and Hubert Darbonne, Chemin de Peronne, Oncy sur Ecole, both of 91490 Milly, France

Filed Oct. 14, 1981, Ser. No. 311,262
Claims priority, application France, Mar. 31, 1981, 81 06427
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—58 **10 Claims**

1. A continuously operating hydro-extractor with a perforated wall which is a figure of revolution driven in rotation about its axis so that a layer of material collects on the wall, comprising advancing members acting on the material layer to advance the material layer in a downstream direction, the path of travel of any one point on the advancing members in the

region where said members cooperate with the material layer on the perforated wall comprising a component in the diametrial plane and an axial component in said downstream direction.



4,432,149

CALENDER IRONING MACHINE WITH ADJUSTABLE ROLL PRESSURE

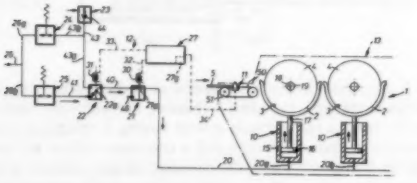
Clifford G. Banks, Sunderland, England, assignor to Neil and Spencer Limited, United Kingdom

Filed Apr. 21, 1981, Ser. No. 256,026

Claims priority, application United Kingdom, Nov. 27, 1980, 8038148

Int. Cl.³ D06F *65/10*

U.S. Cl. 38—55 **6 Claims**



1. A calendar ironing machine of the type comprising at least one heated ironing bed defining a concave ironing surface cooperating with a padded ironing roller rotatable within the concavity of the surface, comprising actuating means for creating relative movement between the padded roller and the concave surface so as to vary contact pressure therebetween, sensing means for detemining the presence or absence of a laundry workpiece en route to the roller, and pressure control means for operating the actuating means whereby a relatively high padded roller/concave surface pressure is provided when a workpiece is present and a relatively low roller/concave surface pressure is provided when a workpiece is absent, while maintaining a contiguous relationship between said padded roller and said concave surface.

4,432,150

STRETCHER FRAME FOR AN ARTIST'S CANVAS

Russell A. Swonger, Rte. 3, Box 3112, Spooner, Wis. 54801

Filed Jun. 9, 1982, Ser. No. 386,713

Int. Cl.³ D06C *3/08*

U.S. Cl. 38—102.5 **8 Claims**

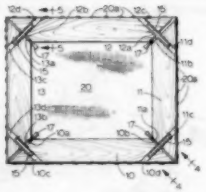
1. A stretcher frame for an artist's painting canvas, said frame comprising,

a plurality of frame members adapted to receive a layer of canvas attached to the outer edges thereof across the front of the frame members,

adjacent frame members having mating ends with the mating surfaces thereof beveled, said adjacent frame members having passages formed therein which are sloped forwardly toward the mating surfaces,

a connecting bridge slidably mounted in each of said passages and extending across the mating ends from one frame member to another to slidably connect the same in a manner to produce a tilting of said frame members to displace the inner edges thereof rearwardly from the plane of the canvas attached to said frame,

the bevel of the frame members being such that the mating surfaces of adjacent frame members are generally parallel



one to the other with the bridges respectively mounted in said passages, and

wedges driven between said parallel mating surfaces to expand the space between the mating ends and stretch the canvas attached to said frame members.

4,432,151

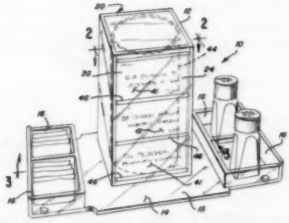
ADVERTISING DISPLAY APPARATUS

Stanley Morris, 13 Woodside Rd., Springfield, N.J. 07079

Filed Jul. 30, 1982, Ser. No. 403,575

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 D **16 Claims**



1. In combination:

a base;

means on said base for holding condiments;

a plurality of support members on said base, each support member facing in a different respective direction;

means for mounting at least one advertisement on each of said support members;

means mounting said support members for movement relative to said base to change the direction in which a given advertisement faces;

a hollow, transparent tube having a plurality of walls and constituting transparent cover means for enclosing and protectively covering said support members;

each support member and its respective advertisement facing a respective wall on said transparent tube; and,

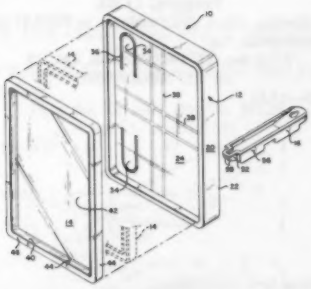
a resilient, strip-like member located within said tube and resiliently deformable between an expanded, open first condition and a second condition in which said strip-like member is at least partially closed for urging the advertisment on each support member toward its respective wall on the transparent tube.

4,432,152

PICTURE FRAME ARRANGEMENT

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Feb. 3, 1981, Ser. No. 231,187
Int. Cl.³ A47G *1/24*
U.S. Cl. 40—152.1 10 Claims



1. A picture frame arrangement comprising:

a frame having a planar principal support member of lateral and longitudinal extent and a peripherally extending boundary element projecting approximately perpendicularly from both the frontal and rearward surfaces of said support member;

first and second pairs of web means, each of said pairs in spaced parallel relationship extending in straight line fashion between opposed areas along said boundary element projecting substantially perpendicularly from the rearward surface of said support member, said first pair disposed laterally, and said second pair disposed longitudinally;

a plurality of tabs integral with said web means extending transversely between said first pair of web means and between said second pair of web means at positions juxtaposed to said boundary element;

a window positioned across the frontal side of said support member and including a peripheral rim that interengages said boundary element to retain the frame and window in a fixed yet separable, relationship; and

a hanger/holder comprising an elongate body portion having a pair of opposed parallel sides, a pair of parallel spaced apart elements depending substantially perpendicularly from said body portion along said pair of sides, and a tongue projecting from an end of said body portion, said tongue and said spaced apart elements being selectively engageable with each of said pairs of web means to provide an appropriate means for supporting said frame arrangement atop a surface and hanging said frame arrangement on a wall.

4,432,153

CUP WITH DETACHABLE BOTTOM

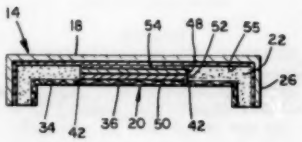
Gilbert Bachman, and Byrne Heninger, both of Atlanta, Ga., assignors to Dittler Brothers, Inc., Atlanta, Ga.

Filed May 27, 1982, Ser. No. 382,624
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—324 5 Claims

1. A nestable and stackable beverage cup for carrying and relinquishing a contest game piece on the bottom thereof, said cup comprising:

a single layered, substantially frustoconically tapered wall portion defining an open top end and an open bottom cavity;

a laminated cup bottom mounted in said open bottom cavity of said wall portion to close said open bottom cavity, said laminated cup bottom including a downwardly disposed annular flange so that said cup bottom will be held spaced apart from the cup bottom of an adjacent one of said cups in a nested stack of said cups, said laminated cup bottom comprising a fluid retaining layer and a game piece layer, said game piece layer comprising a sheet of material having perforations formed therethrough and defining a boundary partitioning said game piece layer into a mounting portion and a game piece portion, indicia printed on at least one side of said game piece portion, and adhesive set between said fluid retaining layer and said mounting portion of said game piece layer, said game piece portion being selectively removable at said boundary of perforations from said laminated cup bottom; and



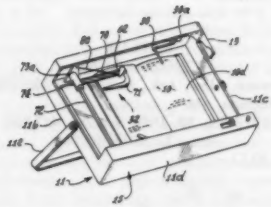
means for joining said wall portion to said cup bottom to provide a seal therebetween.

4,432,154

PAGE MANIPULATION APPARATUS IN APPARATUS FOR AUTOMATICALLY TURNING PAGES

James A. D'Arcy, Laguna Beach, Calif., assignor to Dejon Corporation, Long Beach, Calif.

Filed Mar. 8, 1982, Ser. No. 355,347
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—531 17 Claims



1. In apparatus for sequentially turning pages of a book or the like, the combination comprising

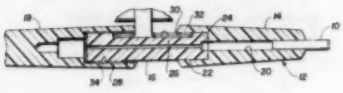
(a) structure forming a zone to receive said pages,

(b) a turned page holder located proximate said zone to hold down a turned page, and

(c) actuator driven means operatively connected with the holder for displacing same between down and up positions, the down position characterized in that the holder is maintained in clamping engagement with an edge portion of a turned page while a page to be turned is being displaced in the turn direction, said up position characterized in that the holder is temporarily raised to allow the turning page to be displaced downwardly onto a previously turned page, after which the holder returns to said down position,

(d) the improvement comprising said holder including a first part movable up and down, and a second part carried by the first part for swinging movement relative thereto during holder displacement between said up and down positions.

4,432,155
FISHING ROD
Earl Miller, Miami, Fla., assignor to Larco Products, Inc., Miami, Fla.
Filed Mar. 23, 1982, Ser. No. 361,062
Int. Cl.³ A01K *87/06*
U.S. Cl. 43—22 **6 Claims**



1. In a fishing rod having a rod blank and a handle portion, the improvement wherein

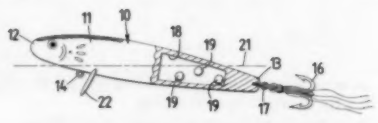
said handle portion is formed of a plastic foregrip portion made unitary with the end of said rod blank; a reel seat portion made integral with the rear portion of said foregrip; and a rear grip portion engageable and disengagable with the rear portion of said reel seat;

said reel seat having a flat portion for the seating thereon of the foot of a reel;

the back portion of said foregrip and the front portion of said reel seat cooperating to form a gap for receiving therewithin the front end of the foot of a reel; and

said rear grip being engageable with the rear portion of said reel seat in such a way as to cause the foreward end of said rear grip to overly said flat portion of said reel seat to thereby overly and clamp therebetween the rear portion of a reel foot, and thereby hold a reel firmly in place on said flat portion.

4,432,156
FISHING LURE
James R. Gowing, Altus, Ark., assignor to EBSCO Industries, Inc., Birmingham, Ala.
Filed Sep. 13, 1982, Ser. No. 417,031
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.31 **3 Claims**



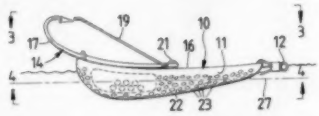
1. A fishing lure comprising,

(a) an elongated body having means subjacent the front end portion thereof for connecting the body to a fishing line and having at least one fishing hook carried by the rear end portion thereof,

(b) there being an elongated cavity within the rear portion of said body, and

(c) a plurality of movable weights within said cavity with said cavity and said weights being constructed and arranged for said weights to move within said cavity while said body is floating at rest to urge said body to a generally upstanding position with its front end portion extending above the surface of the water and for said weights to move within said cavity upon retrieval of said body along the surface of the water to impart oscillation to said body about an elongated axis extending along the surface of the water and through the lower surface of said front end portion and the upper surface of said rear end portion in opposite directions with said weights being below said elongated axis and said oscillating movement of said body producing a rattling sound that attracts fish.

4,432,157
FISHING LURE
James R. Gowing, Altus, Ark., assignor to EBSCO Industries, Inc., Birmingham, Ala.
Filed Sep. 27, 1982, Ser. No. 424,325
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.31 **4 Claims**



1. A fishing lure comprising,

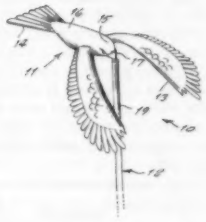
(a) an elongated body having means at the front end thereof for attaching a fishing line,

(b) a rearwardly and upwardly extending fishing hook carried by the upper rear portion of said body,

(c) there being at least one enclosed cavity within said body, and

(d) a plurality of movable weights within said cavity with said cavity and said weights being formed and arranged for said weights to move within said cavity in response to movement of said body through the water with the movement of said weights oscillating said body about an elongated axis of rotation extending above the longitudinal center line of said body to produce a rattling sound attractive to fish.

4,432,158
BALANCING BIRD
William M. Nicholas, Route 2, Box 660-K, Golden, Colo. 80403
Filed Feb. 28, 1983, Ser. No. 470,547
Int. Cl.³ A63H *13/00*
U.S. Cl. 46—131 **1 Claim**



1. A balancing bird assembly, comprising, in combination, a bird figurine depicting a bird in flight and a pole upon which said bird figurine is supported in a balanced condition; said bird figurine including a body having a head at a forward end thereof, a downward beak on said head, a rearward tail and a pair of opposite, sideward wings, said tail and said wings forming spread-apart, balancing counterweights for said figurine when said beak is rested upon said post; said body comprising a hollow, rigid shell including said head, said beak, and base portions of said tail and said wings, an independently pivotable unit inside said body comprising a rigid frame including a downwardly spur protruding out of a hole through a tip of said

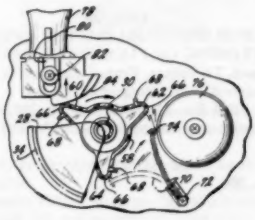
beak for resting also upon said post, and outward end portions of said tail and said wings protruding out of wide openings through ends of said tail base portion and said wing base portions; an upper end of said post including a horizontal, small surface upon which said beak and said spur may pivot; and a lower end of said post is mounted upon a rigid base.

4,432,159

TOY AND ASSOCIATED NOISE PRODUCING MECHANISM

Hideyuki Kanno, Tokyo, Japan, assignor to Tomy Corporation, Carson, Calif.

Filed Jul. 13, 1981, Ser. No. 282,583
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—177 **11 Claims**



1. A sound producing device which comprises:

a base;

a rotating means rotatively mounted on said base, said rotating means capable of rotating on said base in both a clockwise and a counterclockwise direction;

an elongated member having ends, said member located on said base adjacent to said rotating means with one of said ends connected to said base in a position such that the other of said ends of said member comprises a movable end which is capable of being contacted by said rotating means;

said rotating means contacting and engaging said member and moving said movable end of said member in a first direction in response to rotation of said rotating means in one of said clockwise or counterclockwise directions;

said rotating means contacting and engaging said member and moving said movable end of said member in a second direction in response to rotation of said rotating means in the other of said clockwise or counterclockwise directions;

a noise emitting means mounted on said base and operatively associated with said movable end of said member, said noise emitting means capable of emitting noise of at least two different types;

said movable end of said member interacting with said noise emitting means in response to movement of said movable end of said member in said first direction to cause said noise emitting means to emit a noise of a first type, said movable end of said member interacting with said noise emitting means in response to movement of said movable end of said member in said second direction to cause said noise emitting means to emit a noise of a second type.

4,432,160

MICRORGANISM INHIBITION OF FROST DAMAGE TO PLANTS

Steven E. Lindow, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 20, 1981, Ser. No. 294,604
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—2 **17 Claims**

1. A method for inhibiting frost injury to a plant host susceptible to frost injury due to ice nucleation capable bacteria which comprises:

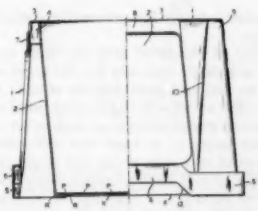
applying to said host plant or a part thereof antagonistic nucleation deficient bacteria capable of substantially diminishing the availability of a limited nutrient provided by said host plant, whereby said antagonistic bacteria colonize said plant and inhibit colonization by ice nucleation capable bacteria.

4,432,161

RECEPTACLE FOR CUT FLOWERS

Peter de Bruin, Maarheze, Netherlands, assignor to Coöperatieve Vereniging "Verenigde Bloemenveilingen Aalsmeer" (V.B.A.) W.A., Aalsmeer, Netherlands

Filed Nov. 19, 1981, Ser. No. 322,762
Claims priority, application Netherlands, Nov. 20, 1980, 8006327
Int. Cl.³ A01G *5/00*; B65D *85/50*
U.S. Cl. 47—41 R **13 Claims**



1. A receptacle for the storage and shipment of cut flowers, said receptacle forming a stackable unitary structure molded of a synthetic material, comprising

an inner container body in the shape of a truncated pyramid of substantially rectangular cross-sectional shape and having a flat horizontal bottom wall and four flat side walls upwardly and outwardly sloping from said bottom wall to terminate in an upper circumferential upper edge enclosing a rectangular opening of larger area than said bottom wall,

an outer skirt structure enclosing said inner container body and having the general shape of a four-sided truncated pyramid of rectangular cross-section with downwardly and outwardly sloping sides, said skirt structure having a circumferential upper edge integrally connected to said container body upper edge, and a circumferential lower edge having support edge portions extending substantially in the plane of said container body bottom wall,

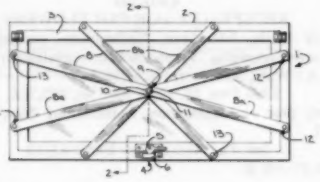
said skirt structure in the region of said lower edge thereof having a stiffening section including a lower handgrip and including a circumferentially extending double-walled reinforcing rim of inverted U-shaped cross-section, said reinforcing rim having, at each side of said skirt structure, a raised central portion, the lower edge of which being at a level sufficiently above said lower edge support portions to form the lower handgrip allowing the insertion of a hand therebelow,

each of said sides of said skirt structure having a central opening occupying the greater part of the surface area of said side, the central opening being enclosed by a top peripheral portion, bottom peripheral portion and opposed side peripheral portions defining upper, lower, and side edges, said central opening bounded at its lower edge by said raised central reinforcing rim portion and said opening having a flanged upper edge as a ridge forming an upper handgrip,

said outer skirt structure forming, between said central openings in said four sides thereof, four corner posts each comprising a reinforcing rib portion in the shape of a 90° sector of a truncated upwardly tapering cone extending

between said reinforcing rim and said upper edge of said skirt structure.

4,432,162
PORTAL GUARD
Daniel J. Foote, 7323 Wellauer Dr., Wauwatosa, Wis. 53213
Filed Apr. 12, 1982, Ser. No. 367,397
Int. Cl.³ E06B 9/01
U.S. Cl. 49—55 **2 Claims**

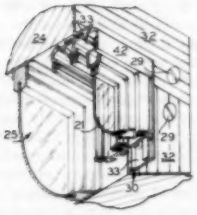


1. A security device for preventing entry through a portal comprising:

a plurality of elongated arms pivotally connected to each other at a single centrally located point intermediate their ends so that said arms may be rotated independently of each other about said single pivot point and be positioned at various angles relative to each other, and

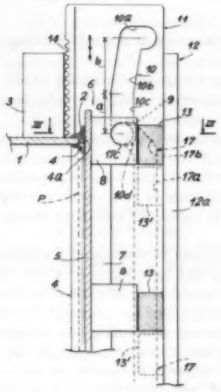
said arms being of at least two different lengths so that rotation of said arms about said single pivot point allows the ends of said arms to substantially conform to all four sides of rectangular openings of various sizes and said arms having mounting means approximate their ends to secure said arms to the frame of the portal.

4,432,163
ADJUSTABLE MOUNTING SYSTEM FOR PATIO DOORS AND THE LIKE
Gerald D. Cassiere, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.
Filed Mar. 17, 1982, Ser. No. 358,849
Int. Cl.³ E05B 65/04
U.S. Cl. 49—63 **4 Claims**



1. An adjustable framework system for mounting a storm glass assembly adjacent a prime assembly contained within a preformed wall opening comprising first and second separate, interconnectable pieces, said first piece being a flange having first and second surfaces connected together at an angle along a common edge, said first surface having opposed planar sides for alternately facing flush against the exterior of said wall surrounding said opening, said second surface having a planar exterior side facing said first surface and an opposed interior side formed with a pair of longitudinally extending L-shaped plan profile ribbings which are in mirror image relation to one another, and said second piece being a frame having a first side facing said second surface interior side formed with longitudinally extending L-shaped plan profile channel members comprising at least a pair of end channel members disposed respectively at opposite ends of said first side in mirror image relation to one another and two spaced-apart pairs of adjacent intermediate channel members disposed between said end channel members, each pair of intermediate channel members being in mirror image relation to one another, and said frame having a second side facing into said opening formed with longitudinally extending mounting means for supporting said storm glass assembly for sliding movement in said opening, each said channel member pairing with a second adjacent one of the remaining channel members which is in mirror image relation to that each said channel member to define a mounting track for engagingly receiving said ribbings such that plural alternative said mounting tracks are provided overlapping one another for selective adjustable positioning of said frame on said flange in said opening.

4,432,164
DEVICE FOR CONTROLLING THE OPENING AND CLOSING OF FLUIDTIGHT DOORS
Paul R. Baguet, Le Taillan, France, assignor to S.A.R.L. Commodore International, Blanquefort, France
Filed Jun. 21, 1982, Ser. No. 390,654
Claims priority, application European Pat. Off., Jun. 25, 1981, 81450008
Int. Cl.³ E05D 15/10
U.S. Cl. 49—209 **8 Claims**

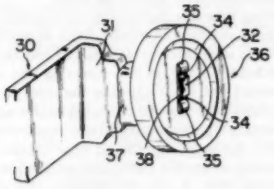


1. A device for controlling the opening and closing of a pressure-resistant door mounted on a frame for translation relative to the plane of an associated access opening, said door controlling device comprising planar slides provided on said door and disposed in planes parallel and perpendicular to said access opening plane, said slides having first guideways defined by slots, said slides being displaceable by translation in their planes parallel to said access opening plane, means for controlling the displacement of said slides, lateral guide members in parallel spaced relation on opposite sides of said door freely displaceable in said first guideways, second guideways receiving said lateral guide members, said second guideways being formed in two wall members fixed to said frame, facing and parallel to said slides, said first and second guideways having paths determined to constrain the movement of said guide members and thereby the panel of said door during displacement of said slides, such that for engagement and disengagement with the edge defining said access opening, said door panel being displaceable at right angles to said access opening and at a distance from said access opening edge, said door panel being displaceable by translation parallel to said access opening plane.

4,432,165
WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

Kinichi Ishii, Yokohama, Japan, assignor to Kabushiki Kaisha Johnan Seisakusho, Japan

Filed Nov. 23, 1981, Ser. No. 324,091
Claims priority, application Japan, Dec. 15, 1980, 55-179933[U]
Int. Cl.³ E05F 11/44
U.S. Cl. 49—351 **6 Claims**



1. A window regulator for an automotive vehicle for moving a window pane for a vehicle door up and down, comprising:

(a) a movable guide rail (**8**) attached to a lower edge of the window pane;

(b) a fixed guide rail (**9**) fixed to the vehicle door;

(c) a main arm (**1**), a first end of which moves along said movable guide rail and a second end of which is pivotably supported on the vehicle door;

(d) a first subarm (**61**), a first end of which moves along said movable guide rail and a second end of which is pivotably supported at a central portion of said main arm;

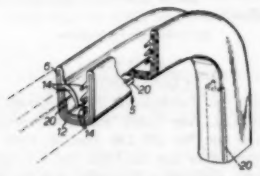
(e) a second subarm (**62**), a first end of which moves along said fixed guide rail and a second end of which is pivotably supported at the central portion of said main arm coaxially with said first subarm; and

(f) a plurality of sliders (**36**) fixedly connected to the respective first ends of said main arm, said first subarm, and said second subarm so as to be slidable along said movable guide rail and said fixed guide rail, said main arm, said first subarm and said second subarm each include at the first end thereof, respectively, a bent portion (**31**) having a slider-fixing portion (**32**) formed with a pair of shoulder portions (**33**) on either side thereof for supporting said slider and a pair of bendable tabs (**35**) at a free end surface thereof for fixing said slider thereto.

4,432,166
TRIMMING OR SEALING STRIPS

Erich Weimar, Viersen, Fed. Rep. of Germany, assignor to Draftex Development AG, Zug, Switzerland

Filed Nov. 24, 1981, Ser. No. 324,778
Claims priority, application United Kingdom, Nov. 29, 1980, 8038398
Int. Cl.³ E06B 7/16
U.S. Cl. 49—491 **7 Claims**

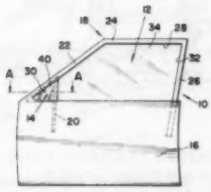


1. A channel-shaped trimming or sealing strip which is shaped so that the side walls of the channel-shape embrace a mounting flange for the strip and which is in the form of a channel-shaped flexible metal carrier covered with flexible covering material defining gripping lips running longitudinally along the inside of the channel on the opposite inside walls thereof so as to grip the said flange, the strip being in combination with a separate, relatively straight, reinforcing member which is fitted within the channel and which is stiff but sufficiently long and pliable to enable it to be bent slightly, with the strip, to hold the strip in a slight curve.

4,432,167
CORNER COVER FOR A WINDOW

Yoshio Watanuki, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 3, 1982, Ser. No. 384,587
Claims priority, application Japan, Jun. 24, 1981, 56-98049
Int. Cl.³ B60J 5/04
U.S. Cl. 49—502 **11 Claims**



1. A corner cover for a window unit having a window frame which forms an opening with a corner, comprising:

(a) a panel attached to the window frame and covering the corner of the opening, the panel and the window frame forming a first recess facing in a direction parallel to the panel;

(b) an outer member covering one surface of the panel;

(c) a flange formed on the outer member, the flange pointing in the direction opposite that of the first recess and fitting into the first recess to engage the panel;

(e) a hooked portion formed on the outer member and defining a second recess which faces in the direction opposite that of the first recess, part of the panel fitting into the second recess to engage the hooked portion, whereby the outer member can be attached to the panel by moving the outer member in one direction along the panel from an offset position to insert the flange and the part of the panel into the corresponding recesses; and

(f) means for preventing movement of the outer member when the outer member would be moved from its attached position in the direction opposite that of attaching movement of the outer member.

4,432,168
FINISHING APPARATUS WITH IMPROVED DISCHARGE DOOR STRUCTURE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed May 11, 1981, Ser. No. 262,552
Int. Cl.³ B24B 31/06
U.S. Cl. 51—163.1 **12 Claims**

1. A vibratory finishing machine, comprising:

(a) a frame structure;

(b) a vibratory tub structure carried on the frame structure but free to vibrate relative to the frame structure;

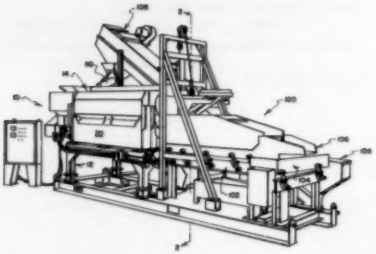
(c) means for vibrating the vibratory tub structure relative to the frame structure for imparting a vibratory finishing action to such workpieces and finishing media as may be inserted into the vibratory tub structure;

(d) the vibratory tub structure having portions which vibrate with the vibratory tub structure and which define a discharge opening through which workpieces and finish-

ing media may discharge from the vibratory tub structure; and,

(e) discharge means for selectively permitting and preventing discharge of workpieces and finishing media from the vibratory tub structure through the discharge opening including:

(i) a closure member movable along a path of travel between an open position wherein workpieces and finishing media are permitted to discharge in a substantially unobstructed manner from the discharge opening, and a retaining position substantially adjacent the discharge



opening of the vibratory tub structure wherein the closure member extends entirely across the discharge opening and serves to retain workpieces and finishing media within the vibratory tub structure when the vibratory tub structure is moving relative to the closure member during operation of the machine; and,

(ii) mounting means, separate from said frame, mounting the closure member for movement along said path of travel and supporting the closure member so that it does not move with the vibratory movements of the vibratory tub structure.

4,432,169

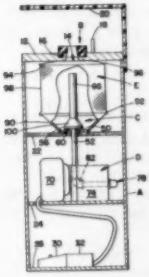
GLASS WARE ETCHING APPARATUS

James R. Schultz, Akron; Francis E. Smith, South Russell, and Ralph J. Jurecki, Cleveland, all of Ohio, assignors to Cole National Corporation, Cleveland, Ohio

Filed May 15, 1981, Ser. No. 264,034

Int. Cl.³ B24C *3/04, 5/04, 9/00*

U.S. Cl. 51—424 **15 Claims**



1. An abrading apparatus for abrading workpieces with abrasive grit, the apparatus comprising:

a workholder for holding a workpiece to be abraded, the workholder having an aperture which is adapted to pass abrasive grit to impinge on a selected region of the held workpiece;

entraining means for entraining abrasive grit in a flow of air, the entraining means including:

a base,

an air inlet tube extending through the base and terminating in a lip having a preselected vertical extension above the base,

an annular disc disposed proximate to the base for defining a generally horizontal, peripheral gap annularly around the inlet tube and adjacent the base, the peripheral gap being disposed between the base and the annular disc, the peripheral gap having a preselected vertical width which is substantially the same as the inlet tube lip vertical extension above the base,

a directing tube of substantially unrestricted internal cross section extending vertically from adjacent and aligned with the inlet tube lip to adjacent and aligned with the workholder aperture for directing the air flow with entrained grit from adjacent the inlet tube lip and the peripheral gap toward the workholder aperture;

air flow supplying means operatively connected with the air inlet tube for supplying the air flow thereto; and,

grit collecting means for collecting grit rebounding from the workpiece held in the workholder, the grit collecting means being disposed adjacent the workholder and being operatively connected with the entraining means to return collected grit to the base to be drawn through the peripheral gap.

4,432,170

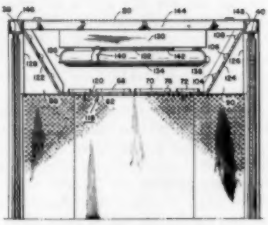
OUTDOOR TELEPHONE BOOTH

Gerald M. Hewell, Dewy Rose, Ga., assignor to Royston Manufacturing Corporation, Royston, Ga.

Filed Jun. 28, 1982, Ser. No. 393,092

Int. Cl.³ E04H *1/14*

U.S. Cl. 52—28 **11 Claims**



1. A telephone booth comprising an enclosure having two vertically elongated translucent side panels extending uninterrupted substantially from the bottom to the top of the booth, a source of illumination located between said side panels near, but below, the top of the booth, and a semitransparent diffuser comprising a substantially horizontal panel located underneath said source of illumination, a first oblique panel located between said source of illumination and one of the two side panels, and a second oblique panel located between said source of illumination and the other of the two side panels, said oblique panels extending in a continuously oblique direction from said horizontal panel upwardly and outwardly toward said side panels.

4,432,171

BUILDING MODULES

Phillip H. Boot, N. Turramurra, NS, Australia, assignor to Hanford Pty, Ltd., New South Wales, Australia

Continuation of Ser. No. 158,230, Jun. 10, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,340

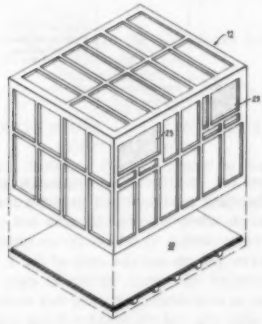
Claims priority, application Australia, Jun. 14, 1979, PD9214

Int. Cl.³ E04H *1/00*; E04B *1/348*

U.S. Cl. 52—79.1 **8 Claims**

1. A method of making a room sized building module having walls and a ceiling comprising the following steps:

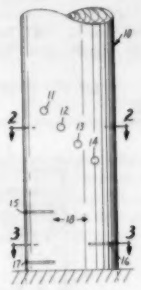
(1) providing premade sheet lining material;
(2) erecting formwork to support said premade sheet lining material;
(3) temporarily fastening said lining material to the formwork to form the interior surface of the module;
(4) erecting reinforcing steel around said lining material appropriate to a three dimensional skeletal frame of reinforced concrete matrix material, said skeletal frame of reinforced concrete matrix material including a perimeter beam surrounding said ceiling and extending along the top of each wall, a vertical column at each wall corner, a beam extending along the bottom of each wall and connecting adjacent vertical columns, a plurality of spaced apart



ceiling frame members in the ceiling forming a grid and extending between sides of the perimeter beam, and a plurality of spaced apart wall frame members forming a grid and extending between adjacent columns and between the perimeter beam and the beam along the bottom of the
(5) applying concrete matrix material to said reinforcing steel and to said lining material to form said skeletal frame around the reinforcing steel thereby bonding said concrete matrix material in the form of a skeletal frame to said lining material;
(6) cutting door and winddow openings in said lining material; and
(7) removing said formwork.

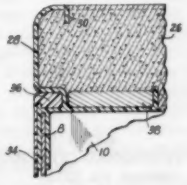
4,432,172
BREAKAWAY TIMBER SUPPORT POLES
Charles R. Kuykendall, Burnsville, and Richard B. Castle, St. Paul, both of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.
Filed Jan. 11, 1982, Ser. No. 338,250
Int. Cl.³ B24B 7/00
U.S. Cl. 52—98 **11 Claims**

1. A method for modifying a timber support pole prior to or after insertion in the ground near a roadway to reduce impact forces if a vehicle collides with the pole, comprising the steps of
(1) cutting one or more recesses in the pole to weaken the pole under dynamic stresses, whereby the pole will break upon impact by a 1000-kilogram vehicle traveling 30 or more kilometers per hour, and unrestrained occupants in the vehicle will be projected forward at less than 12 meters/second; and
(2) filling at least one of the recesses with a polymeric filler composition to increase the bending strength of the pole



by at least one-third over the bending strength of the pole in its cut unfilled form.

4,432,173
SWIMMING POOL INTEGRAL STRUCTURAL WALL BRACE SYSTEM
Werner L. Kleinert, Sterling Heights, Mich., assignor to Carl R. Meyer; Carol S. Meyer, both of Port Isabel, Tex.
Continuation of Ser. No. 131,800, Mar. 19, 1980. This application Feb. 25, 1982, Ser. No. 352,266
Int. Cl.³ E02D 27/00
U.S. Cl. 52—167.7 **10 Claims**



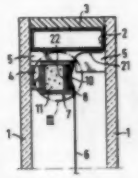
1. In an inground swimming pool wall construction comprised of a plurality of upstanding substantially identical modular units secured together, the improvement comprising:
(a) each modular unit being defined by a sheet of bendable material having an integral vertical flange, at one end thereof, extending substantially perpendicular thereto and outwardly of the pool for imparting rigidity to the wall construction and sustaining vertical compression loading imposed from above, outwardly directed forces imposed by water contained within the pool and inwardly directed forces imposed by surrounding earth;
(b) each modular unit having its opposite end secured to the flanged end of an adjacent unit;
(c) the end portion of each modular unit, adjacent its flange, being offset outwardly by an amount substantially equal to the thickness of the bendable material, with the opposite end of an adjacent unit being seated in the offset;
(d) the offset and the opposite end having mutually nested inwardly open depressions therein;
(e) adjacent modular units being secured together by headed fasteners, the heads of which are seated within the depressions of the innermost of the modular units whereby the nested depressions serve as means for absorbing shear forces developd between the modular units; and
(f) the inner faces of the modular units collectively defining a substantially smooth and continuous interior surface.

4,432,174

SELF-SUPPORTING INSULATION ELEMENT

Paul Grether, Seuzach; Kurt Brader, Winterthur, and Bruno Keller, Zurich, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 22, 1982, Ser. No. 390,946
Claims priority, application Switzerland, Jul. 14, 1981, 4607/81
Int. Cl.³ E04B 1/00
U.S. Cl. 52—222 10 Claims



1. A self-supporting insulation element for a double-paned window, said element comprising

a frame consisting of a torsionally rigid section member having a guide ledge on one side;

at least one longitudinally expansive rubbing strip disposed in said guide ledge for movement relative to said frame;

a single coated foil coaxially stretched over said frame in a plane; and

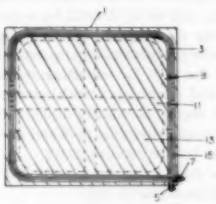
a plurality of spots connecting said foil to said strip in offset relation to said plane towards said frame.

4,432,175

POST-TENSIONED CONCRETE SLAB

Rodney I. Smith, Midland, Va. 22728

Filed Feb. 17, 1981, Ser. No. 234,730
Int. Cl.³ E04B 1/06
U.S. Cl. 52—224 7 Claims



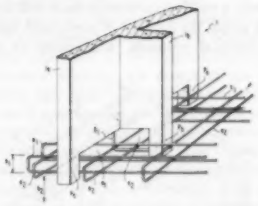
1. A post-tensioned concrete slab assembly comprising a concrete slab, a tendon member, and a pair of anchor means, said tendon member being pre-formed in a loop to define an enclosed area within said slab, said tendon member having ends adjacent one another which extend outside said slab, the tendon member being positioned within the periphery of said slab to form said enclosed area bounded by the tendon member and an exterior slab portion surrounding the enclosed area of the tendon member, said anchor means being secured to the ends of said tendon member so that said tendon member is placed under an original tension of around 28,000 p.s.i.

4,432,176

VERTICAL MODULAR CONSTRUCTION ELEMENT AND CONSTRUCTION METHOD USING THE SAME

M. Edmond H. M. Balzer, 42, Allees Francois-Verdier, 31000 Toulouse, France

Filed Dec. 29, 1980, Ser. No. 220,903
Claims priority, application France, Dec. 28, 1979, 79 32164
Int. Cl.³ E02D 27/00
U.S. Cl. 52—293 2 Claims



1. A method for constructing a masonary retaining wall, comprising disposing a plurality of modular masonary construction elements side by side on end, each said element being of T-shaped cross section in which the crosspiece of the T comprises a principal rib and the stem of the T comprises at least one secondary rib joined thereto at right angles, said element having at least three supporting feet each in prolongation of a free edge of a said rib, said feet being spaced apart by recesses, and at least one U-shaped steel rod embedded in said element in the plane of a said secondary rib and having two vertical legs one of which is embedded in the free edge of said seconary rib and extends down into said foot of said secondary rib but is spaced above the lower end of said foot, the other said leg being embedded in the junction between said at least one secondary rib and said primary rib, a portion of the bottom of said loop being exposed within said recesses, said principal ribs of said modular elements being disposed in edge-to-edge relationship with each other, threading horizontal steel reinforcing rods through said exposed portions of said U-shaped rods and through said recesses from element to element with each horizontal reinforcing rod extending between a plurality of said elements, threading further steel horizontal reinforcing rods parallel to the first-mentioned steel horizontal reinforcing rods and disposed on opposite sides of the plane of said principal ribs, threading horizontal steel reinforcing rods through said recesses parallel to the plane of said U-shaped rod and on opposite sides thereof and above the first-mentioned said rods, and casting concrete about the lower ends of said elements to embed said exposed portions and feet and reinforcing rods in said concrete.

4,432,177

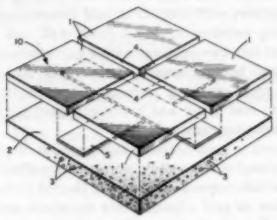
BUILDING BLOCK FOR FLOORS AND WALLS OF A BUILDING

Claudio Amesso, Monza, and Paolo Donaggio, Salo, both of Italy, assignors to Industrie Pirelli, Milan, Italy

Filed Nov. 6, 1981, Ser. No. 318,931
Claims priority, application Italy, Nov. 6, 1980, 25800 A/80
Int. Cl.³ E04F 13/02
U.S. Cl. 52—309.17 10 Claims

1. A building block for laying a floor or wall comprising a plurality of tile blocks bonded to a surface of a synthetic resin base, characterized by the fact that said base comprises a mixture of resin and pieces of acoustical insulation dispersed therein, and means for regulating the quantity of base material which flows to between adjacent edges of the tile blocks, said

means for regulating the quantity of resin composition between the adjacent edges of the tile blocks being a paper sheet disposed between the base and the tile blocks having a hole therein centered below each tile block.

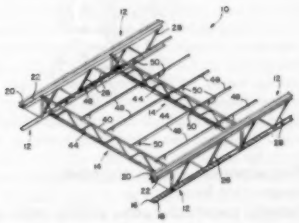


4,432,178

COMPOSITE STEEL AND CONCRETE FLOOR CONSTRUCTION

Buckie A. Taft, Bellevue, Wash., assignor to Steel Research Incorporated, Bellevue, Wash.

Filed Jun. 1, 1982, Ser. No. 383,530
Int. Cl.³ E04B 5/16
U.S. Cl. 52—334 **9 Claims**



1. In a composite steel truss and concrete floor construction having primary steel open web truss framing members, secondary joist framing members supported at their ends on said truss framing members, and a concrete slab, the improvements comprising:

(a) a top chord means for said primary open web truss framing members including generally horizontally disposed support means for supporting the ends of said secondary framing members,

(b) bottom chord means for said primary open web truss framing members and web means structurally interconnecting said top and bottom chord means; and

(c) said concrete slab means being formed so as to extend from a level above the uppermost point of said top chord to a level below the uppermost point of said top chord so as to at least partially embed said top chord means in said concrete and thereby causing said top chord means to function as a continuous shear transfer connector means in said composite floor construction.

4,432,179

LOW HEAT TRANSMISSION FRAMING RAIL STRUCTURE, PARTICULARLY DOOR OR WINDOW FRAMING

Otto Bachmann, Birkenweg 2, CH-6280 Hochdorf, Switzerland

Filed Nov. 16, 1981, Ser. No. 321,404
Claims priority, application Switzerland, Dec. 8, 1980, 9036/80
Int. Cl.³ E04B 1/62
U.S. Cl. 52—396 **15 Claims**

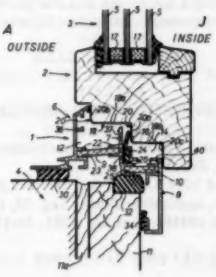
1. Low heat transmission framing rail combination structure, particularly to form aluminum window or door framing elements, for cooperation with a window or door counter element (2)

comprising, in accordance with the invention,

three separate elongated, parallel-oriented metal rails (6, 7, 8) forming a first, outer metal rail (6), a second intermediate metal rail (7), and a third, inner rail (8);

a first insulating material connecting strip (9) secured to the outer rail (6) and to the side of the second, intermediate rail (7) facing the outer rail, and structurally connecting said first, outer and second, intermediate rails together and forming an assembly;

a second insulating material connecting strip (10) secured to the other side of the second, intermediate rail (7) and to the facing side of the third, inner rail (8), and structurally connecting said assembly of the first (6) and the second (7) rails and the first strip (9) to the third rail (8),



the connecting strips (9, 10) extending outwardly from opposite sides of said second, intermediate strip (7), offset with respect to each other along the width of the rail so as to be out-of-alignment with respect to each other to prevent direct heat transmission between said strips through the intermediate rail (7) and forming continuous structural connection strips between said intermediate metal rail (7) and the first, outer metal rail and the third, inner metal rail (8), respectively, while inhibiting metal-to-metal heat transfer between said rails,

and projecting rail strips (36, 37, 40) extending from said separate rails (6, 7, 8) to form, with the window or door counter element, two air chambers (12, 14) separated from each other by the projecting rail strip (37) from the intermediate or second rail (7) and by said two connecting insulating strips (9, 10).

4,432,180

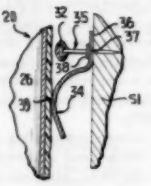
THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

Division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,334,395.
This application May 3, 1982, Ser. No. 374,258
The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.
Int. Cl.³ E04B 1/78
U.S. Cl. 52—407 **6 Claims**

1. A system for insulating building walls, ceilings, floors or like structure comprising wall means for forming a hollow insulating panel defining an interior chamber under negative pressure, means contacting a limited exterior surface area of said panel for supporting said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, means normally spaced from the exterior surface of said panel for contacting a limited exterior surface area of said panel only upon said first-mentioned contacting means becoming inoperative which would in the absence of said second-mentioned contacting means result in direct contact between

said panel and the associated building wall, ceiling, floor or like structure, said second-mentioned contacting means being an elongated pin-like element of relatively small cross-sectional configuration whereby thermal conduction transfer there-



through is substantially negligible, said first-mentioned contacting means being a leaf spring and said pin-like element and leaf spring being disposed in immediate adjacent relationship to each other.

4,432,181

WALL CONSTRUCTION FOR ARCHITECTURAL STRUCTURE

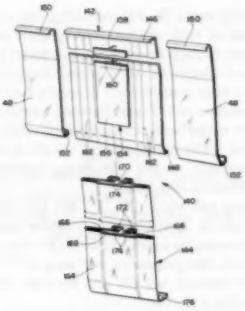
Motokatsu Funaki, 430 Shimo-Tsuchidana, Fujisawa-shi, Kanagawa-ken, Japan

Filed May 5, 1982, Ser. No. 375,253

Claims priority, application Japan, Aug. 13, 1981, 56-119347; Sep. 30, 1981, 56-144186; Sep. 30, 1981, 56-153786; Nov. 11, 1981, 56-167130

Int. Cl.³ E04F *13/08*; E04B *1/54*

U.S. Cl. 52—459 **7 Claims**



1. A wall construction for an architectural structure comprising:

base means;

first coat means laid on said base means;

a plurality of elongated supporting members each formed of metal sheet by bending and disposed on said first coat means in the vertical direction of said wall construction so as to be spaced from each other at a predetermined interval in the lateral direction of said wall construction;

a plurality of sheathing members each fixedly supported at both ends thereof on said adjacent supporting members to cover said first cost means and define a space between said sheathing members and said first coat means, and

face means laid on said sheathing members,

said face means including a plurality of face members disposed adjacent to one another in the lateral direction of said wall construction, said laterally adjacent face members being connected to each other by connecting means, said face members including engaging portions at the upper and lower ends thereof,

said connecting means comprising a connecting member provided at the upper and lower ends thereof with engaging portions respectively fitted with respect to said upper and lower engaging portions of said laterally adjacent face members, and a holding member for holding said adjacent face members with respect to said connecting member;

said holding member having a front wall and a rear wall separated into two sections with a gap interposed therebetween and being formed at the upper and lower ends thereof with engaging portions respectively fitted with respect to said upper and lower engaging portions of said adjacent face members;

ends adjacent to each other of said sections of said rear wall being formed at the outside portion thereof with receiving means which respectively receive therein ends opposite to each other of said adjacent face members; and

said receiving means being filled at the portions thereof adjacent to each other with a calking material

---

4,432,182

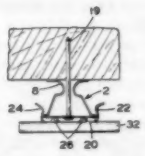
CEILING TILE SUSPENSION SYSTEM

Lee W. Addie, and James C. Ollinger, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 17, 1981, Ser. No. 302,981

Int. Cl.³ E04B *5/52*; E06B *3/54*

U.S. Cl. 52—480 **1 Claim**



1. A ceiling suspension system comprising

(a) a runner structure having:

(1) a generally trapezoidal cross section with a flat base having a plurality of holes of a certain diameter therein and two parallel edges forming flanges;

(2) inwardly of the flanges and fastened to the flat base there are two leg members resiliently mounted and inclined slightly toward each other and each having a lip structure;

(3) the lips of the two legs being spaced apart a distance ranging from slightly less than to the same as the diameter of the holes through the flat base of the runner;

(b) a clip structure comprising:

(1) a flat body having on two opposite sides thereof flange means projecting from the flat base generaly perpendicular therefrom and being of and S-shaped configuration, the spacing between said flange means being such that said flange means will spring away from the edge of the flanges of the runner structure and then spring around the edge of the flange of the runner structure to hold the flat body of the clip adjacent the flat base of the runner;

(2) a C-shaped projection fastened to a third side of the clip flat body, said C-shaped projection having two parallel sides and one perpendicular connecting side with one parallel side being positioned in the plane of the flat body, said perpendicular side extending from the plane of the flat body in a direction opposite from the direction that the flange means extend from the flat body, and the second parallel side of the C-shaped projection being in a plane parallel to the flat body and spaced therefrom;

(c) a ceiling tile positioned adjacent the flat body of the clip and the edge of said ceiling tile being engaged by the side of the C-shaped projection in the plane spaced from, and parallel to, the flat body of the clip; and

(d) a fastening means passing through a hole of the flat base of the runner and between the lips of the legs of the runner into an overlying ceiling structure to mount the runner adjacent

a ceiling structure with the clip being mounted on the runner and a ceiling tile being retained by said clip.

4,432,183

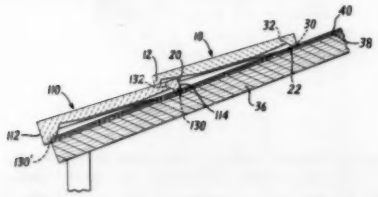
ROOFING TILE

Robert D. Pike, Lake Placid, and Elroy F. Bobolts, Pembroke Pines, both of Fla., assignors to Gory Associated Industries, Inc., Ft. Lauderdale, Fla.

Filed Apr. 3, 1981, Ser. No. 249,002

Int. Cl.³ E04D 1/00

U.S. Cl. 52—533 **4 Claims**



1. In a flat shingle style concrete roofing tile adapted to be laid over an underlayment in a series of courses on a roof and fastened to said roof by mechanical fastening means, the tile having thickened edges along the front, back and sides molded to the underside of the tile, a front edge and a front portion of the side edges forming a step of reduced thickness relative to an adjacent part of the side edges which is adapted to resist a tile in an upper course from sliding down an inclined roof when engaged with the course immediately below it, a rear portion of said side edges and the back edge being shaped so as to provide an extended bearing surface along the back edges and rear portion of the side edges of the tile when said tiles are lapped in successive courses, and complementary flanges extending from each side of the tile, each flange forming a ridge and a groove, the groove of each tile being adapted to receive the ridge of an adjacent tile, the improvement wherein; said roofing tile further comprises:

weep holes molded in a bottom surface of said back edge and having beveled areas along said back edge leading into said weep holes, and a sealant being applied at said extended bearing surface, said beveled areas and said sealant being located so as to divert the flow of water through said weep holes and away from said mechanical fastening means and to provide means for draining water which accumulates between the tile and the underlayment, thereby prolonging the useful life of said underlayment.

4,432,184

SUPPORT FOR THE CONSTRUCTION OF BUILDINGS

Heinrich Holdschlag, Burloerstrasse 63, D-4280 Borken 1, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,059

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 8008815[U]

Int. Cl.³ E04C 3/30

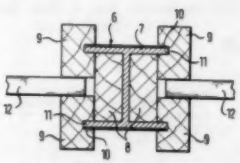
U.S. Cl. 52—732 **15 Claims**

1. A support for upholding at least one building element, said support comprising

four corner elements, with distances of said corner elements from each other in one orthogonal direction at least the size of the building element, and

an intermediate element engaged with each of said four corner elements through a tongue and groove arrangement, said intermediate element receding in at least one orthogonal direction relative to the external side of said corner elements and bearing the load of at least one building element that said support upholds,

said four corner elements at least a height of two building stories and said intermediate element being interrupted at a position where the building element is guided across the intermediate element and between the corner elements,



the length of one individual segment of said intermediate element substantially equivalent to the height of a respective building story.

4,432,185

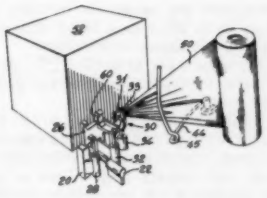
PALLET WRAPPER

Wolfgang Geisinger, 2125 Hingston Ave., Montreal, Canada H4A 2H9

Filed Sep. 1, 1981, Ser. No. 298,316

Int. Cl.³ B65B 11/04, 51/05

U.S. Cl. 53—138 R **6 Claims**

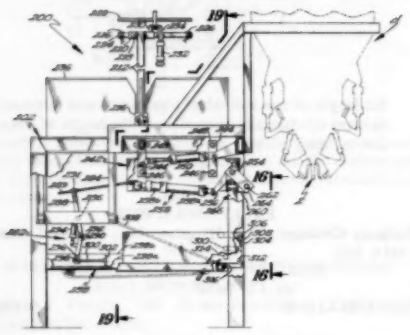


1. A pallet wrapper comprising; a web of wrapping material feedable from a suitable supply, a guide means, an anvil means mounted on said guide means; means to position said anvil means including means to move said anvil means between a retracted position and an extended operative position relative the guide means and the pallet and means to move said guide means between an extended position wherein said anvil means in said operative position is in engagement with the side of a pallet when a pallet is in position and a retracted position spaced from said pallet, a clamp for clamping said web material mounted on said guide means, means for moving said clamp relative to said guide means between an extended position spaced from said pallet and adjacent said anvil, when said anvil is in operative position and a retracted position, means for closing said clamp when in said extended position to hold said web, means for relatively moving said web and said pallet thereby to wrap said web around said pallet in a wrapping operation, during said wrapping operation said web extends around said pallet and in overlying relationship with said anvil and said clamp and the end of said web retained in said clamp thereby to hold the web against the pallet, means for opening said clamp to release the web, said clamp moving means moving said clamp from between said web and said pallet into said inoperative retracted position clear of said web while said web is so held against the pallet, a securing mechanism, means for moving said securing mechanism into position to secure a last layer of said wrapping material when said pallet wrapping operation is substantially completed to an underlying layer thereof adjacent said anvil and a cut-off mechanism for cutting-off said web between said securing means and said clamping means and means to move said cut-off means into cutting position and to activate said cut-off mechanism.

4,432,186
AUTOMATIC BAG HANGER

Harold R. McGregor, 1234 Brady Blvd. P.O. Box 710, Owatanna, Minn. 55060

Continuation-in-part of Ser. No. 146,303, May 5, 1980, Pat. No. 4,322,932. This application Aug. 3, 1981, Ser. No. 289,803
Int. Cl.³ B65B *43/18*
U.S. Cl. 53—69 **10 Claims**



1. An automatic bag hanger for handling and accurately hanging bags to be filled on a filling apparatus comprising gripping means, said hanger comprising:

means for picking a bag to be filled off a stack of bags;

means for transferring said bag from said picking means to a registry position; and

hanging means for hanging said bag on said filling apparatus from said registry position, said hanging means comprising a first moving means movable between a first position adjacent said registry position and a second position closely adjacent to and spaced from said filling apparatus;

a second moving means for moving said hanging means between said second position and a third position located for filling by said filling apparatus; and

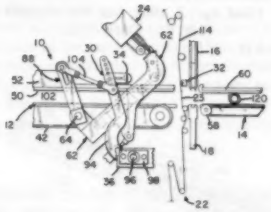
clamping means for clamping a bag to said hanging means, said clamping means being independent of said filling apparatus gripping means allowing said clamping means to hold a first bag in said second position waiting to be filled while said gripping means grips a second bag at said filling apparatus during filling, said hanging means maintaining clamping contact continuously from said registry position until said filling apparatus gripping means grips said bag.

4,432,187
ROLL-WRAPPING APPARATUS AND METHOD

Bertram F. Elsner, and Robert E. Molison, both of Hanover, Pa., assignors to Elsner Engineering Works, Inc., Hanover, Pa.

Filed Nov. 5, 1981, Ser. No. 318,622
Int. Cl.³ B65B *9/02, 61/20*
U.S. Cl. 53—137 **9 Claims**

1. Roll-wrapping apparatus including roll feed means for moving a roll through a work zone, film means for maintaining a film curtain extending across one side of the work zone, a label feeder located on the side of the film curtain away from the work zone for supplying individual labels for pickup, label transfer means movable between a label presentation position in the path of movement of the roll to the work zone adjacent said side of the film curtain away from the work zone and a label pickup position adjacent the label feeder such that individual labels supplied by the feeder are moved to the presentation position with part of the label closely adjacent the film, film seal means at the work zone whereby the label transfer means moves individual labels to said position and the roll feed means moves rolls downstream against the label and film to wrap the label and film around the roll and the film seal means seals the wrapped film to form a film envelope surrounding the roll, wherein the improvement comprises first and second electrostatic charging members positioned on opposite sides of the film curtain and the label when the label is in the presentation position for providing opposite polarity electrostatic charges to the adjacent portions of the label and film curtain,

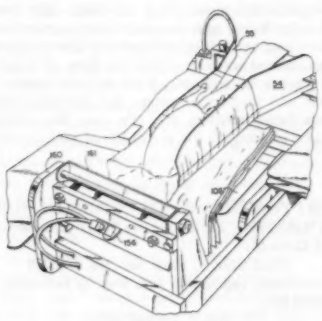


and a charging member shifting mechanism driven by the apparatus responsive to the position of the label transfer assembly for moving the one charging member on said side of the film curtain away from the work zone to a position away from the film and out of the path of movement of the label transfer assembly to and from the label presentation position, the position of the said charging one member adjacent the curtain lying in the path of movement of the label transfer assembly.

4,432,188
METHOD OF STRETCH BAGGING

Harold D. Andrews, College Park, Ga., assignor to Star Packaging Corporation, College Park, Ga.

Continuation of Ser. No. 60,939, Jul. 26, 1979, Pat. No. 4,219,989. This application Jun. 6, 1980, Ser. No. 156,985
The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.
Int. Cl.³ B65B *5/04, 25/02, 43/36*
U.S. Cl. 53—436 **6 Claims**



1. Method of stretch bagging of a fowl carcass comprising:

A. supporting a plurality of open-ended stretch bags in superposed array;

B. forcing pressurized air into the top open-ended stretch bag, so as to open the top bag;

C. axially entering the top bag and transversely stretching from within, while vertically supporting the top bag;

D. stuffing the top bag with an inverted fowl carcass such that the breast plate is uppermost and the legs protrude rearwardly;

E. relaxing said transverse stretching and vertical supporting of the top bag;

F. compressing the fowl within the top bag by interposing a restraining force in the path of longitudinal advance and at

the forward end of said carcass, such that the leg joints of the carcass are broken and the legs are made to conform to the body of the carcass; and

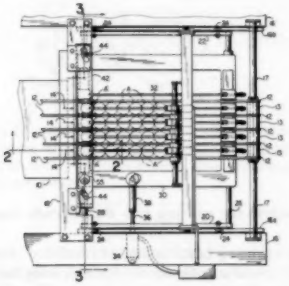
G. removing said top bag from said superposed array of remaining bags.

4,432,189

SHIFTING GRID STYLE PACKER WITH LANE HOLDBACK

John L. Raudat, North Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Jun. 1, 1981, Ser. No. 269,389
Int. Cl.³ B65B *21/06, 21/16*
U.S. Cl. 53—497 **10 Claims**



1. In a shifting grid style packer of the type wherein columns of articles are received from an infeed conveyor between side-by-side longitudinally extending lane guides to be formed into discrete charges for deposit downwardly into upwardly open packing cases, the improvement comprising a fixed frame having longitudinally extending ways oriented parallel to the longitudinally extending lane guides, a grid assembly movable mounted on said ways and itself defining cross slide means oriented transversely to said ways, a shifting grid frame on said cross slide means and having riding strips to support the articles when said grid frame is in one limit position and to allow the articles to drop downwardly in another grid frame limit position, means for shifting said grid frame transversely between said limit positions, article abutment means associated with each column of articles between said lane guides and movable from and to positions wherein said abutment means are aligned with certain of said lane guides, means for causing initial transverse grid frame movement from said one position to achieve corresponding movement of said abutment means as the latter move initially from said lane guide aligned positions, camming means for said grid frame to cause said grid assembly to move downstream in the longitudinal direction in response to further transverse movement of said grid frame toward said another grid frame limit position and means for preventing further movement of said abutment means in response to said further movement of said grid frame toward said another grid frame limit position.

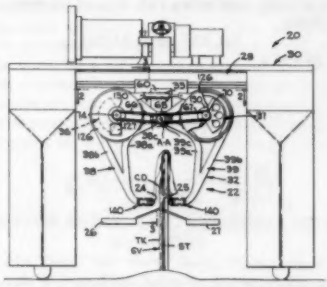
4,432,190

CONTINUOUS HARVESTER FOR PLANTS GROWN IN ROWS

Franklin P. Orlando, Morgan Hill, Calif., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 178,327, Aug. 15, 1980. This application Mar. 18, 1982, Ser. No. 359,558
Int. Cl.³ A01D *46/26*
U.S. Cl. 56—1 **4 Claims**

1. A method of harvesting plants that are grown in rows, such as grapevines, the method comprising the steps of: positioning a pair of elongate striker elements on opposite sides of a plant in a row of plants; translating the elongate striker elements forwardly relative to the plants in the row from one end of the row to the other end thereof, concurrently with such translating, swinging the leading ends of the striker elements back and forth about an axis that is parallel to the row; and concurrently with the translating of the elongate striker elements, swinging the rear ends of the striker elements about an



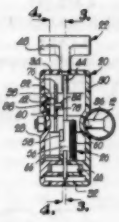
axis that is parallel to the row and at a rate relative to the swinging of the front ends of the elements so that the rear ends impart a different shaking action to a plant therebetween than the shaking action simultaneously imparted by the front ends of the striker elements.

4,432,191

METHOD AND APPARATUS FOR CONTROLLING BLADE CLUTCH ASSEMBLY

Larry D. Schmitt, Newton, Kans., assignor to Conchemco Incorporated, Lenexa, Kans.

Division of Ser. No. 256,902, Apr. 23, 1981, Pat. No. 4,363,206. This application Aug. 30, 1982, Ser. No. 412,498
Int. Cl.³ A01D *69/08*; F16D *23/00*
U.S. Cl. 56—11.8 **4 Claims**



1. A method of engaging the clutch of a power lawnmower to initiate rotation of the blade thereof, there being a shiftable operating cable coupled to the clutch for engaging the same, said method comprising the steps of:

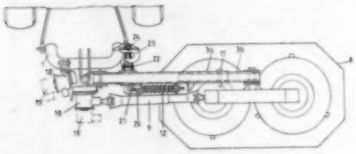
shifting a handle member, and, during and as a result of said shifting thereof, causing a shiftable coupling element to come into operative connection with said cable;

shifting another handle member operatively coupled with said element for shifting of said cable to engage said clutch.

4,432,192
MOWER

Martin Maier, Gottmadingen, and Hermann Ruprecht, Singen, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Gottmadingen, Fed. Rep. of Germany

Filed Aug. 13, 1982, Ser. No. 407,919
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134389
Int. Cl.³ A01D *35/264*
U.S. Cl. 56—15.3 2 Claims

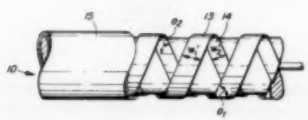


1. A mower comprising in combination, a mower support mount for carrying at least one rotating mowing device on its underside, a support mount carrying beam pivotable between a mowing position and a transport position, a hitching mount for coupling the mower carrying beam to traction means for moving the mowers forward with the traction means, a flexible coupling arrangement on the carrying beam for biasing the mower support mount resiliently toward its mowing position, and comprising a prestressed spring element for said biasing of the mower toward its working position coupled for flexibly permitting the mower support mount to move away from the mowing position when striking an obstacle and to swing back after the obstacle is overcome and to absorb blows when the mower is returned to its transport position by said carrying beam, and a latching mechanism for attaching the carrying beam to the hitching mount to retain it in the mowing position comprising a clasping pocket on the hitching mount for receiving a connecting member on the carrying beam and a locking member for locking the mower into the mowing position and pull cord means permitting a traction means operator to unlatch the carrying beam to return it to the transport position, and means for positioning the spring element parallel to the carrying beam, means for positioning the clasping pocket perpendicular to and on the opposite side of the carrying beam from the spring, and means for coupling the spring element to the locking member in the clasping pocket by means of a flexible chain connected to said connecting member.

4,432,193
METHOD OF GRADING RADIATING TRANSMISSION LINES

Melvin C. Maki, Kanata, Canada, assignor to 501 Control Data Canada, Ltd., Ottawa, Canada

Filed Sep. 20, 1982, Ser. No. 420,069
Int. Cl.³ H01Q *13/22*; H01P *3/06*
U.S. Cl. 57—3 10 Claims

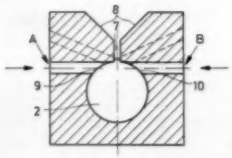


1. A method of manufacturing a leaky coaxial cable comprising the steps of:
providing a core having an inner conductor or conductors surrounded by a dielectric layer;
winding at least two conductive tapes therearound, the tape widths and pitch angles being initially selected to provide predetermined coupling and attenuation characteristics;
varying the tape width of at least one of the conductive tapes along the cable length to vary said coupling and attenuation.

4,432,194
METHOD AND APPARATUS FOR SPLICING THREAD ENDS

Rudolf Luz, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Switzerland

Filed Dec. 10, 1981, Ser. No. 329,331
Claims priority, application Switzerland, Jan. 16, 1981, 300/81
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 10 Claims



1. A method for splicing two thread ends comprising the steps of
providing a splicing head having a turbulence chamber with a generally circular cross-section for receiving the thread ends to be spliced,
inserting the thread ends into the chamber,
tangentially injecting a fluid medium under pressure into the turbulence chamber through at least one first inlet opening to cause generally circular fluid flow in the chamber in one circumferential direction,
terminating flow through the first inlet opening,
tangentially injecting a fluid medium under pressure into the turbulence chamber through at least one second inlet opening to cause generally circular fluid flow in the chamber in the opposite circumferential direction,
terminating flow through the second inlet opening, and
repeating the steps of tangentially injecting and terminating flow alternately through the first and second openings.

4,432,195
DEVICE FOR INTERRUPTING THE FEED OF A ROVING TO DRAWING FRAMES

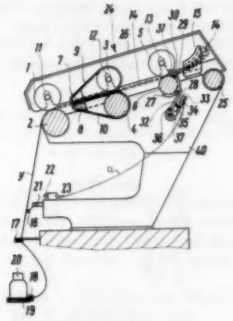
Gerd Stahlecker, Geislingen-Stotten, Fed. Rep. of Germany, assignor to Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,281
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048481
Int. Cl.³ D01H *13/16, 13/18*
U.S. Cl. 57—87 9 Claims

1. Device for interrupting the feed of a roving to the drawing frames of a spinning machine of the type having drawing frames which each comprise a plurality of upper and lower drawing rollers disposed pairwise, said device comprising:
a clamping segment including an engagement means located on one of said drawing rollers adjacent the feed side of the roving, said clamping segment being movable from an operative position permitting the driving of said drawing rollers and feed of said roving to an interrupting position interrupting the feeding of said roving,
a locking device including a locking lever engageable with said engagement means for maintaining said clamping segment in said operative position,
a broken-end detector means for monitoring breaks in thread being spun at the spinning machine,
actuator means responsive to a brief input from a control

means for controlling disengagement of said locking device from said engagement means, and

control means responsive to said broken-end detector means



for controlling said actuator means, wherein movement of the clamping segment to said interrupting position is in response to detection of a broken thread by said broken-end detector means.

4,432,196

TELEPHONE CABLE

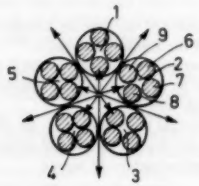
H.-Joachim Schmitz, Sindorf; Dieter Braun, Berg. Gladbach; Dieter Trodler, Düren, and Hugo Cramer, Cologne, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk Aktiengesellschaft, Cologne, Fed. Rep. of Germany

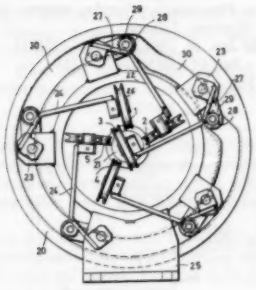
Filed Dec. 18, 1981, Ser. No. 332,360

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110504

Int. Cl.³ H01B *13/04, 11/02*

U.S. Cl. 57—204 **12 Claims**





1. A telephone cable having a center axis and comprising at least one basic group of conductors assembled of at least three component conductors, each component conductor including at least two SZ stranded pairs or quads of wires, and portions of the component conductors in said group being radially transposed across each other so as to periodically change their radial position relative to the center axis of the cable.

5. A method of manufacturing a telephone cable including at least one basic group of at least three component conductors assembled respectively of stranded wires, comprising the steps of feeding simultaneously the individual wires from supply reels to as many stranding stations as there are component conductors assembled in the cable, laying in each stranding station the wires by a SZ stranding process into respective component conductors, and feeding simultaneously the component conductors into a transposing station where the basic group of component conductors is assembled by radially transposing portions of the component conductors across each other.

4,432,197

METHOD FOR PREVENTING ABNORMAL SPLICING IN WINDER

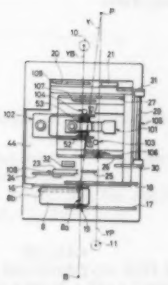
Yutaka Ueda, Nara, and Isamu Ikeda, Kyoto, all of Japan, assignors to Murata Kikai Kabusiki Kaisha, Kyoto, Japan

Filed Dec. 10, 1981, Ser. No. 329,386

Claims priority, application Japan, Dec. 13, 1980, 55-176306

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—261 **8 Claims**



1. A method for preventing abnormal splicing in a winder, in which a yarn taken out from a bobbin through a guide is given an appropriate tension by a tenser, passed through a detecting device for performing detection and cutting of uneven yarn and for performing detection of the runningg yarn, and then wound on a package, characterized in that a first yarn guide suction arm for a yarn on a package side, a splicing apparatus located at a position apart from the normal yarn passage and a second yarn guide suction arm for a yarn on a bobbin side are arranged along the yarn passage and when a plurality of yarn ends sucked by the first suction arm or a slub or other disorder exceeding the allowable range are detected by the detecting device during the splicing operation, a cutter of the detecting device is actuated by a yarn cutting signal from the detecting device to cut the yarn and the yarn is forcibly cut again just after completion of the splicing operation in response to a yarn cutting signal fed from the outside through a timer.

4,432,198

DEVICE FOR CONVEYING COPS

Armando D'Agnolo, Porcia, Italy, assignor to Officine Savio S.p.A., Italy

Filed Mar. 16, 1982, Ser. No. 358,618

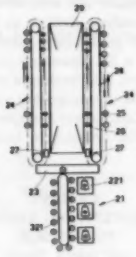
Claims priority, application Italy, Mar. 25, 1981, 83350 A/81

Int. Cl.³ D01H *9/18, 9/02*

U.S. Cl. 57—276 **16 Claims**

1. Device for conveying cops and tubes at the same time between a spinning frame and relative winding heads, comprising a closed-ring powered conveyor means revolving in a substantially horizontal plane along each side of the spinning

frame between one end of said spinning frame and a point of delivery of the cops to the winding heads pre-arranged downstream from said spinning frame; a plurality of pins for bearing the cops or tubes anchored to said conveyor means; guide means for said pins, and a loading/unloading station where the



tubes are loaded and said cops are doffed from spindles of the spinning frame, said cops being conveyed on a side of the closed-ring conveyor means away from said spinning frame while said tubes to be fitted to the spindles of said spinning frame are conveyed on the side of said conveyor means adjacent said spinning frame.

4,432,199

MACHINE FOR SZ-TWISTING BY MEANS OF A TWISTING DISC AND A TUBULAR ACCUMULATOR

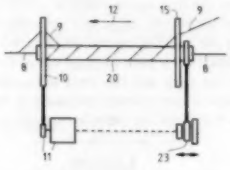
Wolfgang Dzyck, Neustadt; Bernd Hoppe, Berlin; Martin Loczenski, Neustadt; Dieter Vogelsberg, Coburg, and Fred Wolf, Rödental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,121

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3123171

Int. Cl.³ D07B *3/00, 7/00*

U.S. Cl. 57—294 **9 Claims**



1. In a machine for SZ-twisting by means of a stationary aperture guide disc and a reversibly driven twisting disc, where the elements to be twisted are fed to the twisting disc along a tubular guide and tubular accumulator arranged concentrically to the twisting axis and extending from the aperture guide disc to the twisting disc, the improvement comprising drives for the twisting disc and the tubular accumulator designed so that the tubular accumulator can be driven at a speed of rotation which differs from the speed of the twisting disc.

4,432,200

METHOD FOR THE SUCTION REMOVAL OF THREAD BREAKS AND THREAD SUCTION APPARATUS

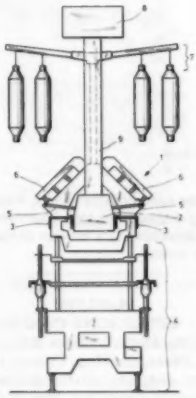
Jürg Bischofberger, Heftenbach, and Herbert Stalder, Kollbrunn, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jun. 28, 1982, Ser. No. 392,625

Claims priority, application Switzerland, Jul. 17, 1981, 4705/81

Int. Cl.³ D01H *11/00*

U.S. Cl. 57—304 **9 Claims**



1. A method for removal by suction of thread breaks, in particularly at a double-sided ring spinning machine, comprising the steps of:

conducting a first air stream which is at a negative pressure through a suction duct provided with suction nozzles and extending over essentially the entire length of the ring spinning machine;

sucking away by means of the first air stream fibre and thread particles through the suction nozzles;

forming a second air stream in a duct which is arranged substantially parallel to the suction duct through which flows the first air stream; and

branching-off the second air stream from the first air stream at a location where the first air stream has attained an air velocity of at most approximately 18 m/sec.

4,432,201

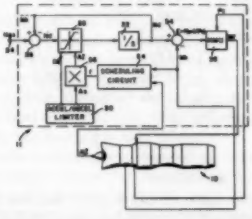
ACCELERATION LIMIT RESET

David J. Hawes, Pierrefonds, Canada, assignor to Aviation Electric Ltd., Montreal, Canada

Filed Jan. 14, 1981, Ser. No. 224,977

Int. Cl.³ F02C *3/10, 9/28*

U.S. Cl. 60—39.161 **3 Claims**



1. An acceleration limit reset means for a fuel control of a

two-spool gas turbine engine during mismatched spool speeds including means for generating an acceleration limit, said reset means characterized by:

means for generating a high spool speed signal proportional to the actual speed of the high pressure compressor;

means for generating a low spool speed signal proportional to the actual speed of the low pressure compressor;

means, receiving said high and low spool speed signals, for generating a multiplication factor as a function of said high and low spool speed signals; and

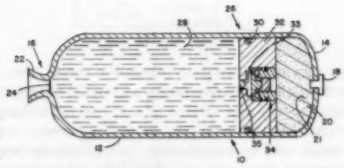
means for multiplying said acceleration limit by said factor.

4,432,202

FLOW-THROUGH PYROTECHNIC DELAY

Robert E. Betts; Nathan P. Williams, and Arnold T. Stokes, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 7, 1981, Ser. No. 261,347
Int. Cl.³ F02K *9/10, 9/28*
U.S. Cl. 60—221 **7 Claims**



1. A delay device for controlling the time between initiation of a first impulse to initiation of a second impulse comprising:

a. a first housing having igniter means carried therein;

b. a sleeve and a base plate disposed in mating relation to form a chamber therebetween, said sleeve and said base plate forming a second housing, said second housing carried in said first housing;

c. a pyrotechnic carried in said chamber;

d. a plurality of vent passages extending through said base plate, said vent passages arranged in a circle in said base plate;

e. a transition zone disposed in said second housing to vent gases from said chamber responsive to ignition of said pyrotechnic by said igniter means, said transition zone defined by passages disposed between said base plate and said sleeve, said transition zone passages disposed adjacent said chamber and said vent passages and in direct communication therewith.

4,432,203

ROTARY EXTERNAL COMBUSTION ENGINE

Victor H. Fischer, Artarmon, Australia, assignor to Thermal Systems Limited, Cayman Islands

Filed Dec. 12, 1980, Ser. No. 215,866
Claims priority, application Australia, Jul. 16, 1980, PE4553
Int. Cl.³ F01K *21/04*
U.S. Cl. 60—511 **30 Claims**

1. A method of operating a rotary external combustion engine having a stator and a rotor therein defining a working space, wherein energy is transferred to a working gas from a heated vaporizable liquid heat-transfer medium, which comprises

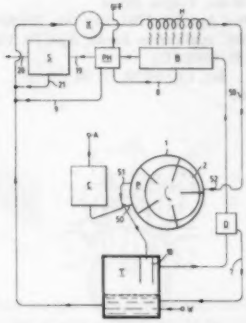
(1) inducting working gas into the working space;

(2) generating externally of the working space heated heat-transfer medium under a pressure such as to maintain the medium in the liquid state;

(3) after induction, injecting heated liquid medium into the working gas and allowing at least part of the liquid medium to vaporize, so as to raise the internal energy of the gas;

(4) in an expansion cycle wherein the volume of the working space increases, allowing the wet gas containing the heat-transfer medium to expand thereby driving the rotor;

(5) exhausting wet gas from the working space near the end of the expansion cycle;



(6) separating liquid heat-transfer medium from wet exhaust gas containing heat-transfer medium vapor; and

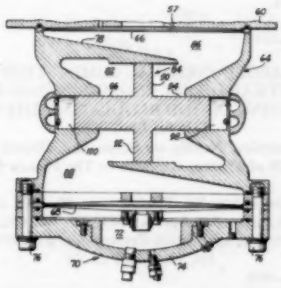
(7) recycling the separated liquid medium to stage (2) above.

4,432,204

LINEAR HYDRAULIC DRIVE SYSTEM FOR A STIRLING ENGINE

Michael M. Walsh, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 2, 1982, Ser. No. 384,303
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **10 Claims**



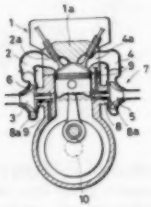
1. A hydraulic drive system for transferring power from a periodic pressure wave directed along a first axis to the movable member of a load means, comprising:

a housing filled with an incompressible fluid and sealed at its opposite ends by first and second flexible diaphragms, said first diaphragm being arranged to be exposed to the periodic pressure wave and said second diaphragm being arranged as part of a gas spring means; and means within said housing for directing the pressure wave produced in said incompressible fluid by action of said periodic pressure wave along an axis which is substantially at right angles to said first axis, said means including a cylinder which is transverse to said first axis and a drive member disposed within said cylinder for sealed, reciprocating movement therein.

4,432,205
SUPERCHARGER APPARATUS FOR INTERNAL COMBUSTION ENGINE

Kazuo Inoue, Tokyo; Minoru Matsuda, Chofu, and Kentaro Kato, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1981, Ser. No. 255,856
Claims priority, application Japan, Apr. 25, 1980, 55/54351; Apr. 25, 1980, 55/55987[U]
Int. Cl.³ F02B *37/00, 61/02*
U.S. Cl. 60—605 **4 Claims**



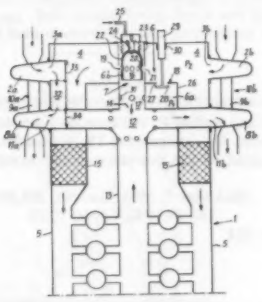
1. A supercharger apparatus for a vehicle comprising a reciprocating type internal combustion engine having a block, an exhaust passage and an intake passage, an exhaust port connected to said exhaust passage and an intake port connected to said intake passage, wherein said exhaust port and said intake port are disposed on opposite sides of said engine block, such that there is a crossflow therebetween, and having an exhaust turbine provided in said exhaust passage, a compressor provided in said intake passage and a shaft other than the engine crankshaft, extending through said block for interconnecting said turbine and said compressor, said shaft being supported in a single bearing hole formed in the engine block and said turbine being disposed in front of said engine and exposed to air flow caused by movement of the vehicle, for cooling purposes, and a lubrication oil passage, which is in communication with the bearing hole, being formed in said engine block.

4,432,206
SUPERCHARGED INTERNAL COMBUSTION ENGINES, IN PARTICULAR DIESEL ENGINES, AND IN METHODS FOR STARTING UP AND REGULATING THE SPEED OF THESE ENGINES

Jean F. Melchior, Neuilly-sur-Seine, and Thierry M. Andre, Paris, both of France, assignors to The French State, Paris, France

Continuation of Ser. No. 272,292, Jun. 10, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,267
Claims priority, application France, Jun. 17, 1980, 80 13402
Int. Cl.³ F02B *33/44*
U.S. Cl. 60—606 **24 Claims**

1. In a supercharged internal combustion engine comprising air intake means and exhaust means, at least two compressors having outlets which are capable of being connected in parallel through a common connection passage to said air intake means, a plurality of turbines each mechanically drivingly connected to an associated one of said compressors to form therewith a turbocharger unit, said turbines having inlets which are capable of being connected in parallel through a common transfer passage to said exhaust means, means which are responsive to a parameter of operation of the engine which represents a ratio between the air flow through the engine and the total air flow discharged by said compressors and are arranged to selectively interrupt and ensure communication between the outlet of the compressor of one of said turbocharger units and said connection passage and between the inlet of the turbine of said one turbocharger unit and said transfer passage in accordance with the value of said parameter; the improvement comprising bypass means between said compressor outlet and said turbine inlet of said one turbocharger unit, and valve means cooperative with said bypass means and associated with said parameter responsive means so as to be controlled by said parameter responsive means in such manner that at the same time as said parameter responsive means interrupt said communication with said outlet of said compressor and with said inlet of said turbine of said one

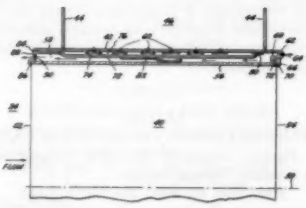


turbocharger, said parameter responsive means also directly connect through said bypass means said outlet of said compressor to said inlet of said turbine of said one turbocharger unit and, inversely at the same time as said parameter responsive means ensure said communication, said parameter responsive means interrupt said connection through said bypass means of said outlet of said compressor to said inlet of said turbine of said one turbocharger unit.

4,432,207
MODULAR CATALYTIC COMBUSTION BED SUPPORT SYSTEM

Lewis B. Davis, Jr., Schenectady, and Charles E. Steber, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,696
Int. Cl.³ F03B *00/00*
U.S. Cl. 60—723 **14 Claims**



1. A support structure for a cylindrical ceramic catalyst bed for use with a gas turbine combustor, comprising:

an outer cooled support cylinder;

said outer cooled support cylinder including apertures therethrough effective for permitting entry of compressed air from a surrounding space;

a cylindrical outer ceramic shell concentric within said outer support cylinder and spaced therefrom to form an annular space therebetween;

a sheet meal heat shield in said annular space interposed between and concentric with said outer cooled support cylinder and said cylindrical outer ceramic shell, said heat shield being effective to form a first passageway for permitting air entering through said apertures to flow gener-

ally along an outer surface of said heat shield in a first axial direction, apertures for permitting said air to flow around an end of said heat shield, and a second passageway for permitting said air to flow in a second opposite axial direction along an inner surface of said heat shield and apertures to permit said air to exit into a main stream of gas flowing through said combustor, whereby entry of a fuel-air mixture into said annular space is prevented and said support cylinder and said heat shield are cooled without unduly cooling said outer ceramic shell.

4,432,208

COLD TRAP

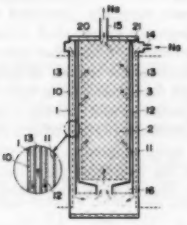
Osamu Onuki, Kasama, and Toyohiko Kirisawa, Mito, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu, Jigyodan, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,287

Claims priority, application Japan, Sep. 25, 1981, 56-143107[U]

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **5 Claims**



1. A cold trap including a section for cooling inflowing liquid sodium, a section for trapping precipitated impurities in said liquid sodium, a sodium inlet nozzle communicated with said cooling section, a sodium outlet nozzle communicated with said trapping section, and a double-walled cylindrical structure disposed between said cooling section and said trapping section, said double-walled structure being filled with a heat-insulating gas, characterized in that said double-walled cylindrical structure is closed at its upper end but open at its lower end and that an expanded portion for storing the heat insulating gas is formed at the open lower end and/or in the vicinity thereof of said double-walled structure.

4,432,209

SECONDARY COOLING SYSTEM FOR GAS COMPRESSORS

James E. Landry, 107 F Williamsburg Cir., Lafayette, La. 70508, and Richard B. Babb, Rte. 2, Box 5, No. 124, Scott, La. 70583

Filed Jun. 21, 1982, Ser. No. 390,322

Int. Cl.³ F25D *25/00*

U.S. Cl. 62—62 **16 Claims**

1. A method for independently cooling various components of a gas compressor, comprising the steps of:

a. providing a primary cooling system;

b. interrupting the flow of coolant within the primary cooling system into the components to be cooled;

c. providing a secondary source of coolant;

d. providing an inlet flow line into the components to be cooled and an outlet flow line out from the components to be cooled;

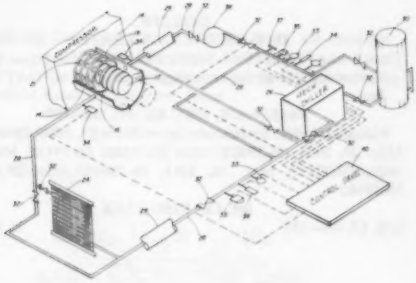
e. flowing said coolant through said components to be cooled within said inlet and outlet lines;

f. providing a first cooling means;

g. routing said coolant from said components to be cooled into a first cooling means;

h. providing at least a second cooling means;

i. routing said coolant from said first cooling means into at least said second cooling means; and



j. routing said coolant from said second cooling means into said inlet line of said components to be cooled.

4,432,210

AIR CONDITIONING CONTROL METHOD

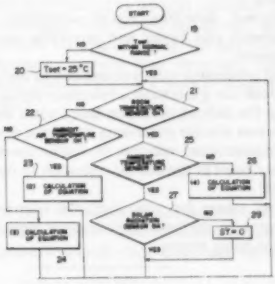
Takao Saito, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

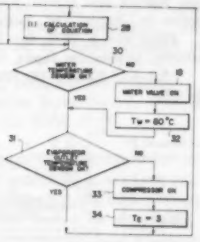
Filed Feb. 24, 1982, Ser. No. 352,065

Claims priority, application Japan, Apr. 3, 1981, 56-50348

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—126 **18 Claims**





1. A method of controlling an air conditioning apparatus comprising the steps of:

monitoring the operating condition of at least one sensor which detects an ambient condition about an area to be air conditioned;

selecting one of a plurality of calculation formulae for obtaining a desired outlet air temperature within an allow-

able range on the basis of the operating condition of said at least one sensor; and

adjusting said air conditioning apparatus in accordance with said one of said plurality of calculation formulae.

4,432,211
DEFROSTING APPARATUS

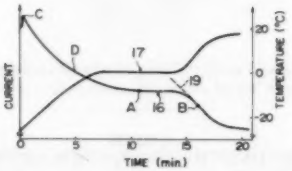
Tetsu Oishi; Makoto Oda, both of Yokohama, and Hisao Futaki, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,313

Claims priority, application Japan, Nov. 17, 1980, 55-160788; Mar. 20, 1981, 56-39437; Mar. 20, 1981, 56-39438; Mar. 20, 1981, 56-39439; Mar. 20, 1981, 56-39440; Mar. 20, 1981, 56-39442

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—155 **21 Claims**



1. A defrosting apparatus for removing frost deposited on a cooler comprising:

a heater exhibiting a positive temperature coefficient of resistance which changes sharply at a specific temperature;

a current detecting circuit detecting current flowing through said heater and providing an output indicative thereof;

signal processing means connected to said current detecting circuit for generating a reference signal at one point during the defrost operation based upon the detected heater current and for generating an output signal indicative of a predetermined relation of heater current detected at a later point in the defrost operation to the reference signal; and

control means for controlling the current supplied to said heater on the basis of the output signal from said signal processing means.

4,432,212
HERMETIC TURBO-REFRIGERATOR APPARATUS

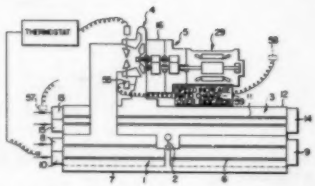
Keiji Tachibana, Tokyo; Masatosi Terasaki, Ibaraki; Yoshihiko Nakayama, Ibaraki, and Junichi Kaneko, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,510

Claims priority, application Japan, Nov. 13, 1978, 53-138882

Int. Cl.³ F25B *1/00*; F04B *49/00*

U.S. Cl. 62—229 **12 Claims**



1. A hermetic turbo-refrigerator apparatus comprising:

a turbocompressor for raising a pressure of a refrigerant in a gaseous state in a predetermined level;

a condensor for cooling and at least condensing the refrigerant in a gaseous state having its pressure raised;

a pressure reducing means for reducing the pressure of the refrigerant changed into a liquid state from the gaseous state by condensation;

an evaporator vaporizing the refrigerant in the liquid state having its pressure reduced to thereby cool a refrigerant to be cooled;

an electric motor for driving an impeller of said turbocompressor;

a speed increasing gear system for increasing the number of revolutions of an output shaft of said electric motor when rotation of said output shaft is transmitted to said impeller, said speed increasing gear system being adapted to change the speed increase ratio at least in two stages, said speed increasing gear system comprises a gear box, at least one support means supported by said gear box, said support means including a cylindrical portion, a bearing mounted on an inner side of said cylindrical portion of said support means, at least two bearings mounted on an outer side of said cylindrical portion of said support means, said rotary shafts including a first shaft supporting the impeller of said turbocompressor rotatably journaled by said gear box through bearings, the second shaft rotatably journaled by said bearing mounted on the inner side of said cylindrical portion of said support means, at least two first gears coupled to said first shaft, and at least two second gears rotatably supported by said bearings mounted on the outer side of said cylindrical portion of said support means, said second gears being adapted to mesh with said first gears;

operating means for switching from outside the speed increasing gear system from one speed increase ratio to another;

a detector for detecting external conditions of the atmosphere in which said hermetic turbo-refrigerator apparatus is installed;

means for indicating an optimum speed increase ratio in accordance with the external conditions detected by said detector; and

wherein housings of said turbocompressor, said speed increasing gear system and said electric motor are connected together in such a manner that the output shaft of said electric motor, rotary shafts of said speed increasing gear system including a shaft for supporting the impeller of said turbocompressor are arranged hermetically sealed in the respective housings to avoid a leakage of working fluid of the turbo-refrigerator to the outside.

4,432,213
AIR-CONDITIONING SYSTEM OF MOTOR VEHICLE

Hiroaki Katahira, and Shigeru Kobayashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 17, 1982, Ser. No. 349,462

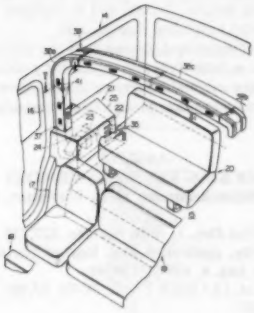
Claims priority, application Japan, Feb. 28, 1981, 56-28800

Int. Cl.³ B60H *3/04*

U.S. Cl. 62—239 **10 Claims**

1. An air-conditioning system for use in a motor vehicle having a vehicle body including a floor panel, a roof panel, and a side wall member and a seat structure mounted on the floor panel and located inside and adjacent said side wall member, the air-conditioning system comprising an air-conditioner assembly which is positioned between said seat structure and said side wall member and which includes at least one heat exchanger unit and a covering member having the heat exchanger unit enclosed in a space which is defined by the covering member, said floor panel and said side wall member and which is located above the floor panel, said covering member having a substantially horizontal upper panel portion located sidewise inwardly of said side wall member and outwardly of

said seat structure and above a horizontal plane flush with the upper surface of the cushion portion of said seat structure so



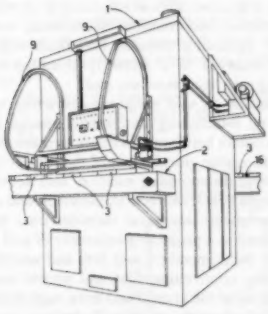
that the covering member is operable as an armrest for an occupant of said seat structure.

4,432,214

DEVICE FOR INSERTION AND FEED OF PRODUCTS ON THE PLATES IN A HORIZONTAL PLATE FREEZER

Angelo Richelli, and Guido Battistella, both of Brugherio, Italy, assignors to Samifi Babcock Samifi Internationale S.A., Paris, France

Continuation of Ser. No. 167,111, Jul. 9, 1980, abandoned. This application Aug. 19, 1981, Ser. No. 294,561
Claims priority, application France, Jul. 23, 1979, 79 18968
Int. Cl.³ F25C *5/14*
U.S. Cl. 62—341 **6 Claims**



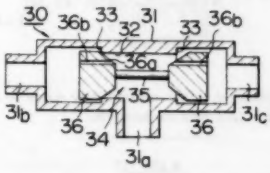
1. An apparatus comprising a freezer including a plurality of vertically-movable horizontal plates, inlet means and outlet means on substantially the same plane within said freezer, and means for sequentially moving said horizontal plates to the inlet/outlet planes; a plurality of U-shaped pushing means, each pushing means having at least one seating area within its periphery; means for conveying said U-shaped pushing means to the surface of said horizontal plates through said freezer inlet with the legs of each U-shaped pushing means facing away from said freezer inlet, and means for conveying said pushing means away from said freezer outlet; said conveying means delivering said pushing means to the surface of each plate in sequence such that each succeeding pushing means delivered to the surface of said plate drives all pushing means ahead of it on said plate across said surface substantially exclusively through forces exerted by the pushing means, said conveying means carrying each of said U-shaped pushing means from said freezer outlet to said freezer inlet with substantially no frictional engagement between said freezer and said U-shaped pushing means and with no disengagement of said U-shaped pushing means from said conveying means at any point between said freezer outlet and said freezer inlet.

4,432,215

PRESSURE DIFFERENTIAL AUTOMATIC TRANSFER TYPE THREE-WAY VALVES

Shoichi Yoshida, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 26, 1982, Ser. No. 401,564
Claims priority, application Japan, Aug. 3, 1981, 56-121627
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—324.6 **15 Claims**



1. In a pressure differential automatic transfer type three-way valve utilized in a heat pump type refrigeration system together with a transfer valve for transferring an operation state of said refrigeration system, said three way valve including a casing and a slider contained therein, said slider being moved by a difference in pressures of refrigerant acting upon opposite sides of said slider caused by transfer operation of said transfer valve for changing flow of said refrigerant through said refrigeration system, the improvement wherein said pressure differential automatic transfer type three-way valve is formed with a leakage passage having a leakage resistance R_4 expressed by a relation

$$R_4 < \frac{R_2 R_3}{R_1}$$

where R_1 represents flow resistance of said transfer valve, R_2 leakage resistance thereof, and R_3 flow resistance of said pressure differential automatic transfer type three-way valve.

4,432,216

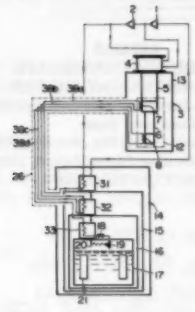
CRYOGENIC COOLING APPARATUS

Toshiharu Matsuda; Kenjiro Kasai; Seiichi Kikkawa, all of Kudamatsu; Norihide Saho, Yamaguchi, and Kouzo Matumoto, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,464
Claims priority, application Japan, Nov. 6, 1981, 56-177195
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**

1. A split type cryogenic cooling apparatus comprising: compressor means for compressing a working gas of a low pressure to discharge a working gas of a high pressure; a refrigerator having an expansion means for expanding said high pressure working gas to generate cold heat; a cryostat utilizing said cold heat generated by said refrigerator to cool an object to be cooled, said cryostat containing a vessel for receiving liquified working gas together with said object to be cooled, and at least one shield plate surrounding said vessel; a communication pipe system for connecting said refrigerator and said cryostat to each other; said cryostat accommodating heat exchangers arranged in at least two stages, said heat exchangers having cold ends thereof respectively held in thermal

contact with said shield plate and said vessel such that the shield and and the vessel temperatures are maintained at predetermined temperature levels substantially equal to a temperature of the respective heat exchangers.



4,432,217

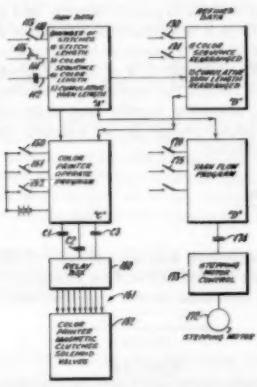
COLORED YARN PRINTING APPARATUS

Arnold Ochsner, 3200 Fort Charles Dr., Naples, Fla. 33940

Filed Dec. 14, 1981, Ser. No. 330,683

Int. Cl.³ D06B *1/14, 11/00*

U.S. Cl. 68—5 D **8 Claims**



2. In a system for color printing and processing multiple yarn fibers by mechanized means in response to signals derived from computerized control means indicative of fabrics having select color patterns or designs the system comprising:

(1) needle stitching means including a sample pattern for producing new data in the form of electrical impulses responsive to the tracing of said pattern by the said needle stitching means indicative of the pattern and color thereof,

(2) computer means for receiving said new data electrical impulses derived from said needle stitcing means and referring the raw data electrical impulses with command signals indicative of the pattern to be duplicated,

(3) power control means including reciprocal controllable pneumatic means responsive to the command signals from the said computer for developing fluid streams disposed to produce driving forces in a direction to produce the patterns to be duplicated by the mechanical means,

(4) mechanized apparatus including dual abutting printing roller means disposed to receive said pneumatic fluid forces to activate said roller means to uniformly color print circumferentially the multiple yarn fibers, and color saturate same in accordance with the pattern to be duplicated as the yarns pass through the dual abutting roller means,

(5) multiple yarns processing means for receiving said yarns to fix the colors printed thereon and to separate the multiple yarn fibers into individual strands, and

(6) means for receiving and playing back the said printed yarns directly into a loom type apparatus for producing fabrics duplicating the original pattern or in the alternative storing said yarns for later usage in said loom apparatus.

4,432,218

LOCKING KEY WITH MEMORY

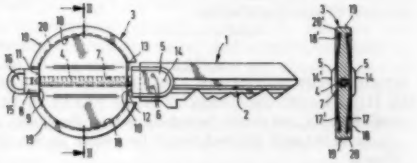
Jost Hoener, Bühlackerstrasse 19/B, Vörstetten, Fed. Rep. of Germany

Filed Dec. 3, 1981, Ser. No. 327,235

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046215; Aug. 4, 1981, 3130744

Int. Cl.³ E05B *19/00, 19/04, 41/00*

U.S. Cl. 70—395 **7 Claims**



1. A locking key comprising:

a head member grippable by fingers of a user;

a shank member provided with a lock-operating bit;

coupling means enabling relative rotation of said members about an axis extending in longitudinal direction of said shank member, said coupling means being constituted by an axially extending threaded bolt rigid with said shank member received in a matingly threaded bore axially traversing said head member; and

abutment means on said members restricting said relative rotation by establishing two axially spaced positions of positive contact between said shank member and said head member to enable entrainment of the former by the latter in respective directions of rotation; said abutment means comprising a first transverse shoulder on said shank member and a second transverse shoulder on a terminal element secured to a projecting extremity of said bolt remote from said shank member, said first and second shoulders respectively confronting first and second lands of said head member at the ends of said bore, said shoulders being separated from each other by a distance exceeding the mutual separation of said lands by a fractional pitch of the threading of said bolt whereby a gap equal to said fractional pitch exists between said first shoulder and said first land in a first limiting position and between said second shoulder and said second land in a second limiting position.

4,432,219

KEY CONCEALMENT ATTACHMENT

Robert F. Bassett, 126 Grandview Ter., Batavia, N.Y. 14020

Filed Aug. 31, 1981, Ser. No. 298,089

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—456 R **1 Claim**

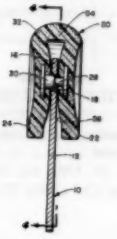
1. In combination with a key, said key having a shank section attached to an enlarged handle section, an opening formed within said enlarged handle section, an attachment connectable to said key to facilitate concealment of said key, said attachment comprising:

a bifurcated housing having a pair of spaced apart legs form-

ing a slot therebetween, an apex section connecting together said legs;

a mass of magnetic particles embedded in said apex section of said bifurcated housing to facilitate mounting of said housing to an exterior metallic structure; and

fastening means connected between said legs, said fastening means to pass though said opening to tightly bind together said legs and said handle section of said key, said fastening means to be movable between an open position and a closed position, said fastening means being easily moved



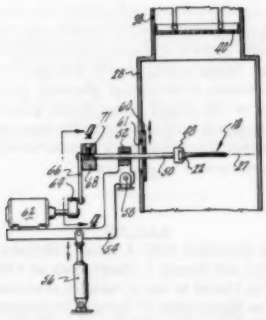
into said closed position but difficult to be moved to said open position, said fastening means comprising a male member and a female member, said closed position being when said male member is imbedded within said female member tightly securing said male member to said female member, movement of said fastening means to said closed position causes the exterior wall of each of said legs to be deflected inwardly to form recesses to thereby form thumb and finger cavities to facilitate operation of said key.

4,432,220

SHOT PEENING APPARATUS

Joseph F. Loersch, Bolton, and James W. Neal, Columbia, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,726
Int. Cl.³ B21J *5/00*
U.S. Cl. 72—53 **12 Claims**



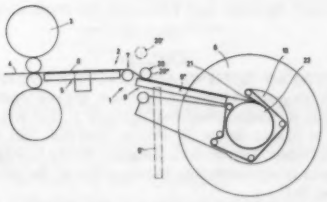
1. Apparatus for shot peening a workpiece comprised of an enclosure for containing shot moving along a streamline, means for recirculating shot, a holder mounted within the enclosure to position a workpiece in a workpiece holding zone along the shot streamline, and means for discharging shot into the enclosure at a low vertical velocity from a multiplicity of openings located vertically above the workpiece holding zone, to enable the discharged shot to be accelerated by gravity toward the workpiece holding zone; characterized by discharge means providing to the shot a small lateral velocity component, to cause the shot discharged from the multiple points to merge to a substantially uniform stream, so that a workpiece is evenly impacted by the shot without the need for lateral movement thereof; a movable holder adapted to position a workpiece so that a first axis is transverse to the shot streamline; and means for rotationally oscillating the workpiece about the first axis.

4,432,221

ROLLING MILL WITH CONVEYING MEANS FOR STRIP AND FOIL MATERIALS

Ernst H. Barten, Siegener Strasse 152, D-5910 Kreuztal, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,200
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036794
Int. Cl.³ B21C *47/12*; B21B *39/14*
U.S. Cl. 72—148 **6 Claims**



1. A rolling mill for strip and foil material, comprising a roll stand, a coiler for rolled material downstream of the roll stand, and endless belt, means to train the endless belt about material on the coiler, air cushion conveyor means for introducing material between the coiler and the endless belt, a frame on which both said air cushion conveyor means and said endless belt are mounted, and means mounting said frame for swinging movement between an operative position in which said air cushion conveyor means is disposed adjacent the path of said material and the endless belt is trained about the material on the coiler, on the one hand, and on the other hand an inoperative position in which the frame is swung away from the material and the coiler.

4,432,222

STRETCH DRAWING APPARATUS

Shin Ujihara, Yokohama, and Takashi Yoshizawa, Ayase, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 28, 1982, Ser. No. 343,472
Claims priority, application Japan, Feb. 13, 1981, 56-20349
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—350 **10 Claims**

1. A stretch drawing apparatus comprising

a constraining die having an inner die portion and an outer wall portion spaced apart from the die portion;

a drawing punch positioned in conjunction with said die portion;

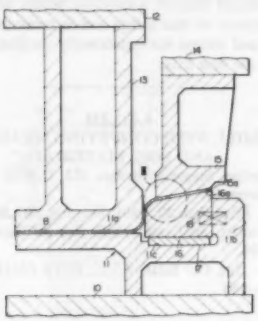
a blank-holding block positioned in conjunction with said outer wall portion of the constraining die;

the constraining die and each of said drawing punch and said blank-holding block being movable relative to each other in a predetermined direction so that said die portion and each of the drawing punch and the blank-holding block are movable toward and away from each other; and

at least one wedge member having a blank-holding surface and movable in a direction perpendicular to said predetermined direction;

said wedge member engaging said constraining die and said

blank-holding block in a direction parallel with said predetermined direction and having in the parallel direction a



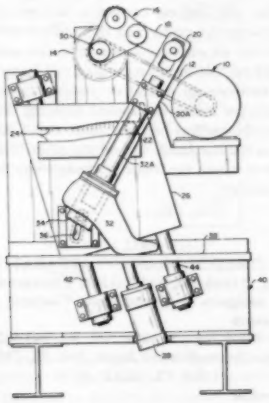
thickness which increases away from the die portion toward the outer wall portion of the constraining die.

4,432,223

FOOTWEAR TESTING APPARATUS AND METHOD

Elmer G. Paquette; Michael J. Maloney, both of Madison, Wis.; Douglas S. Swain, Brockton; Richard F. LaCerte, Hudson, both of Mass.; James B. Peters, Madison, and Robert E. Mast, Dalton, both of Wis., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1982, Ser. No. 405,672
Int. Cl.³ G01M *3/00, 19/00*; G01N *3/56*
U.S. Cl. 73—7 **10 Claims**



1. Apparatus for simulating terrain traversing movements of a human foot comprising:

artificial foot means;

a platform, said platform having a generally planar upper surface;

elongated leg pylon means, said foot means being attached to said pylon means adjacent a first end thereof;

first means for imparting motion to said pylon means, said first motion imparting means being coupled to said pylon means at a point displaced from said simulated foot;

second means for imparting motion to said pylon means;

first cam means, said first cam means including a cam track and cam follower, said first cam means coupling said second motion imparting means to said pylon means a point intermediate the ends thereof, the direction of motion of said pylon means second end resulting from operation of said first motion imparting means being determined by said first cam means and said second motion imparting means, the motion of said pylon means second end simulating the action of the human knee; and

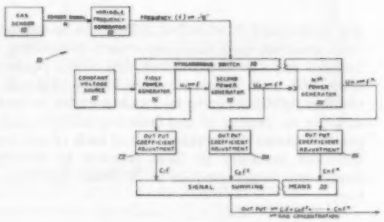
second cam means, said second cam means including a cam track and cam follower, said second cam means coupling said second motion imparting means to said pylon means adjacent the first end thereof, the motion of said foot means relative to said platform being determined by said second cam means in response to operation of said first and second motion imparting means, said second cam means simulating the action of the human ankle.

4,432,224

HYDROGEN SULFIDE MEASURING SYSTEMS AND THE LIKE

Pekka M. Typpo, Cupertino, Calif., assignor to Delphian Corporation, Sunnyvale, Calif.

Filed Apr. 19, 1982, Ser. No. 369,896
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **10 Claims**



1. Apparatus for detecting and measuring a physical phenomenon such as a gas concentration or the like, comprising a sensor element which provides an analog output signal responsive to the physical phenomenon desired to be measured, variable frequency generator means for receiving the sensor element output signal and generating an output signal having a frequency which is a predetermined function of the sensor output signal, power series signal generating means responsive to the output signal of the variable frequency generator means for generating a plurality of output signals respectively proportional to different powers of the frequency of the output signal of the variable frequency generator means, and combining means for providing a combined plurality of the different output signals of the power series signal generating means having predetermined respective combination coefficients to provide an output signal having a predetermined functional correlation to the sensor output signal.

4,432,225

DETECTION SYSTEM FOR A GAS CHROMATOGRAPH

John M. Hayes, and Gerald J. Small, both of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1982, Ser. No. 371,743
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—23.1 **13 Claims**

1. A method for quantitatively analyzing a sample of vaporizable molecules comprising

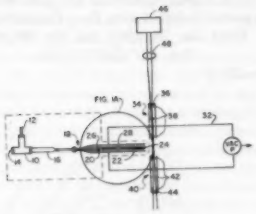
providing a gas chromatography column,

vaporizing said sample,

eluting said vaporized sample through said column,

cooling said eluted sample to substantially depopulate the excited rotational and vibrational levels of the sample molecules while said sample molecules remain vaporized,

irradiating said cooled sample to induce the sample to emit characteristic spectral peaks, and



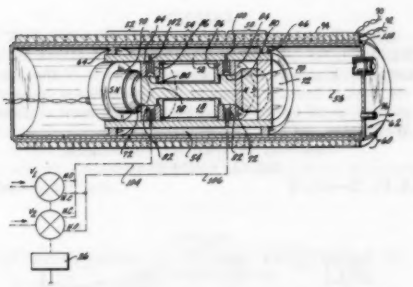
determining the intensity and retention times of said characteristic spectral peaks, said intensity and retention times being indicative of the quantitative analysis of said sample.

4,432,226

METHOD AND APPARATUS FOR MEASURING GASEOUS OXYGEN

Philip T. Dempster, 644 McCorkle Ave., St. Helena, Calif. 94574

Filed Feb. 5, 1982, Ser. No. 346,010
Int. Cl.³ G01R *33/14*
U.S. Cl. 73—27 A **7 Claims**



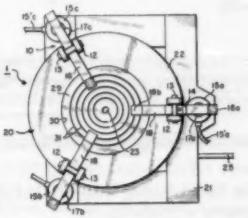
1. In a system for measuring the percentage content of oxygen gas in an unknown or sample gas by comparison with a reference gas, the combination of a magnetic bridge including means forming a pair of major flux circuits, each having a gap therein, valve means for synchronously and alternately filling said gaps with the reference and sample gases, means interconnected between said major flux circuits for forming a null magnetic bridge arm for deriving a magnetic flux proportional to the difference in circuit reluctance of the major magnetic circuits, sense coil means coupled to said null arm for generating a time varying electrical signal proportional to the magnetic flux in said null arm.

4,432,227

VALVE TESTING APPARATUS

Emmett L. Dunn, 103 Lazy Springs (April Sound), Montgomery, Tex. 77356

Continuation of Ser. No. 146,172, May 2, 1980, Pat. No. 4,311,038, and a continuation-in-part of Ser. No. 19,813, Mar. 12, 1979, abandoned. This application Oct. 5, 1981, Ser. No. 308,462
The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.
Int. Cl.³ G01M *3/04*
U.S. Cl. 73—49.8 **7 Claims**



1. An apparatus for testing a device having an annular flange, said apparatus including:

a test plate for supporting said annular flange, said plate having a fluid inlet;

at least one clamping unit comprising:

(a) a lever disposed in a radial direction relative to said annular flange, said lever having an outer end detachably resting on an underlying support and an inner end adapted to grip a portion of said flange,

(b) a fulcrum fixedly mounted above said lever intermediate the lever's inner and outer ends, said lever being adapted to pivot about said fulcrum, and

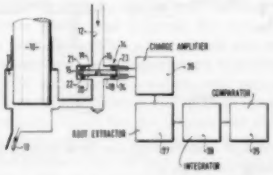
(c) force-producing means exerting a controllable vertical force against one end of said lever.

4,432,228

FUEL INJECTION ARRANGEMENT

Heinz Kuschmierz, Gerlingen, and Wilhelm Vogel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,566
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101902; Mar. 25, 1981, 3111669; Oct. 22, 1981, 3141899
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **12 Claims**



1. A fuel injection control arrangement for an internal combustion engine, comprising means for receiving an electrical signal corresponding to a quantity of a supplied fuel, comparing an actual value with a nominal value of the supplied fuel quantity, and producing a correcting signal for fuel supply; and means for measuring the quantity of a supplied fuel and producing the corresponding electrical signal, said measuring means including a quartz pressure measuring diaphragm producing the corresponding electric signal by a piezoelectric effect on quartz because of a differential pressure on said mea-

suring diaphragm, said quartz pressure measuring diaphragm including a monocrystal quartz plate with a diaphragm opening of an identical diameter over its entire length and with two outer surfaces exposed to the differential pressure, and electrode means provided on said outer surfaces.

4,432,229

WHEEL WEAR MEASUREMENT SYSTEM

Markus Nowogrodzki, Sussex, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,055
Int. Cl.³ G01M *17/00*
U.S. Cl. 73—146 **4 Claims**

1. A system for measuring wear of a wheel on a moving vehicle comprising in combination:

first means for providing a signal V_1 indicative of the measurement of the actual velocity of said vehicle independent of wheel motion;

second means of providing a signal V_2 indicative of revolutions per unit time of said wheel; and

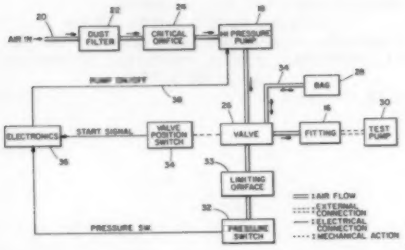
means responsive to signals V_1 and V_2 for determining the difference between V_1 and V_2 at time spaced points at at least one value of V_1 to determine therefrom wear of said wheel.

4,432,230

METHOD AND APPARATUS FOR CALIBRATING PUMPS

John A. Stahler, 609 Maple La., Elk Grove, and Takashi Yamaguchi, 875 Tree La., Prospect Heights, both of Ill. 60070

Filed May 25, 1982, Ser. No. 381,799
Int. Cl.³ G01M *19/00*; G01F *25/00*
U.S. Cl. 73—168 **14 Claims**



1. A method of determining the flow rate of a pump under test comprising the steps of:

(a) pumping fluid into a receptacle for a selected period of time via an orifice having a known maximum flow rate, said fluid being under sufficient pressure to maintain the said maximum flow rate through said orifice so that the volume of fluid pumped into the receptacle during said selected time period is known;

(b) evacuating the receptacle using the pump under test;

(c) measuring the time period required to perform step (b);

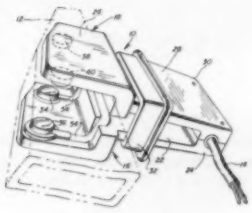
(d) calculating the flow rate of the pump under test from the known volume of fluid evacuated and the time period required to perform step (b).

4,432,231

ULTRASONIC LEVEL DETECTOR

E. Thomas Napp, Lake Zurich; R. C. Stauber, Hawthorn Woods, and Thomas R. Lillegard, Crystal Lake, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 28, 1982, Ser. No. 392,984
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 V **14 Claims**



13. An ultrasonic detector, which comprises:

a pair of opposed arms for connection to a container which carries fluid to be sensed;

one of the arms carrying a transmitting transducer and the other arm carrying a receiving transducer which faces the transmitting transducer;

a clamping ring that is slidable on both arms for forcing the arms toward each other when the ring is moved in one direction and for enabling the arms to move apart from each other when the ring is moved in a direction opposite to the one direction;

each arm comprising a front portion carrying one of the transducers and adapted for engagement with the container, a contiguous intermediate portion on which the clamping ring is slidable, and a contiguous rear portion that is fastened to the rear portion of the other arm;

each of the transducers being potted in a resilient material which deforms to substantially comply with the surface of the container; and

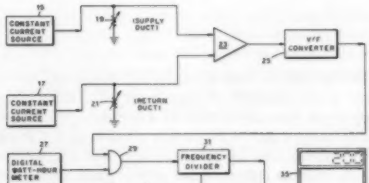
said rear portions operating to provide a hinge for the front and intermediate portions.

4,432,232

DEVICE AND METHOD FOR MEASURING THE COEFFICIENT OF PERFORMANCE OF A HEAT PUMP

Vanston R. Brantley, Knoxville, and Donald R. Miller, Kingston, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 18, 1982, Ser. No. 379,418
Int. Cl.³ G01M *19/02*
U.S. Cl. 73—432 R **7 Claims**



1. A device for measuring the coefficient of performance of an electrically operated heat pump having a supply air stream and a return air stream, comprising:

means for measuring the temperature differential between said return air stream and said supply air stream and generating a first signal having a frequency proportional to the temperature difference of said streams;

means for measuring the operating energy input to said heat pump and generating a second signal having a frequency proportional to said energy input;

means for determining the ratio of said first signal frequency to said second signal frequency and generating a third signal having a frequency proportional to said ratio; and

a programmable counting means for counting the cycles of said third signal over a preselected time period to register counts according to a preselected counting increment for each of said cycles of said third signal so that the registered count value at the end of said time period is directly indicative of the coefficient of performance of said heat pump over said time period.

4,432,233

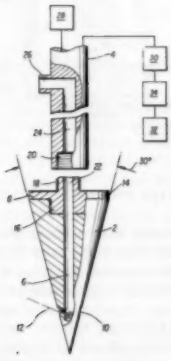
APPARATUS FOR SIMULATING SOIL MECHANICAL IMPEDANCE ON ROOT GROWTH POTENTIAL

Earnest W. Tollner, Experiment, Ga., assignor to The University of Georgia, Athens, Ga.

Filed Jun. 24, 1982, Ser. No. 391,833

Int. Cl.³ G01M *3/00*

U.S. Cl. 73—432 SD **8 Claims**



1. An apparatus for simulating soil mechanical impedance on root growth potential, said apparatus comprising:

a penetration probe comprising a right conical element having a longitudinal axis;

means for advancing said probe along said longitudinal axis;

means for supplying a lubricating fluid to the conical surface of said probe; and

means for measuring resistance of said probe to movement along said axis.

4,432,234

DETERMINATION OF PLASTIC ANISOTROPY IN SHEET MATERIAL

Alun Jones, Neath, Wales, assignor to British Steel Corporation, London, England

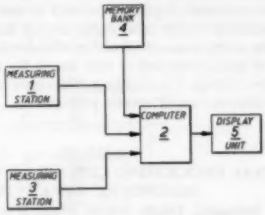
Filed Jan. 21, 1982, Ser. No. 341,571

Claims priority, application United Kingdom, Jan. 23, 1981, 8102185

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 **9 Claims**

8. Apparatus for determining the average plastic strain ratio (r) of sheet material, comprising a first station having means for propagating mechanical vibrations through the thickness of the sheet, a second station having means for measuring sheet thickness independently of the elastic property of the sheet material, computer means for processing the outputs from the first and second stations and comparing the processed output with stored values representative of r and predetermined by



conventional means for that sheet material, and a display unit having means for providing a direct reading of r upon identity between said processed output and a said stored value.

4,432,235

ULTRASONIC INSTRUMENT WITH TIME AND AMPLITUDE GATE BAR DISPLAY

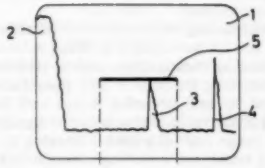
Peter Renzel, Düren, and Hanno Jacobs, Langenfeld, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Jul. 26, 1982, Ser. No. 402,152

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1981, 3139570

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—611 **9 Claims**



1. An ultrasonic test instrument including pulse generator means for periodically applying electrical pulses to a test probe adapted to be coupled to a workpiece for causing ultrasonic search pulses to be transmitted into such workpiece; receiver means coupled to said probe for receiving echo pulses arising from the search pulses intercepting a defect in the workpiece; display means including a cathode ray tube for displaying on the screen of the tube said echo pulses; time gate means coupled to said pulse generating means and receiver means for causing repetitive gated time intervals for providing to the display means only such echo pulses which are received by said receiver means from a predetermined workpiece region; means coupled to said time gate means, said receiver means and said display means for causing said cathode ray tube screen to display a variable length horizontal gate bar the length of which is commensurate with the duration of said gated time interval, and the height of which above a zero line is commensurate with the value of a predetermined reference voltage provided by means for generating a reference voltage, the improvement comprising:

means coupled to said receiver means and said means for generating a reference voltage for causing repetitively received echo pulses within corresponding gated time intervals to be compared with an incrementally increasing reference voltage provided by said means for generating a reference voltage;

means coupled to said means for generating a reference voltage and said display means for causing said bar to be

displayed on said screen at the height commensurate with the value of said reference voltage;

means for causing the height of said gate bar to be retained at a constant amplitude on said screen responsive to the amplitude of the echo pulse having the maximum amplitude relative to additional received echo pulses, and

switch means coupled to said means for generating a reference voltage for resetting said reference voltage to said predetermined reference voltage.

4,432,236

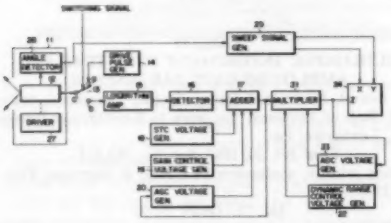
SIGNAL PROCESSING CIRCUIT OF ULTRASONIC DIAGNOSTIC APPARATUS

Tatsuo Nagasaki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 331,125

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—631 **8 Claims**



1. A signal processing circuit for an ultrasonic diagnostic apparatus, comprising:

means for detecting an echo signal from ultrasonic scanning means and for providing a detected echo signal output;

gain-controlling means connected to said detecting means for controlling the level of gain provided an echo signal detected by said detecting means and for providing a corresponding gain-controlled echo signal output;

dynamic range control means connected to said gain-controlling means and including means for generating a dynamic range control voltage and a multiplier for multiplying the gain-controlled echo signal output from said gain-controlling means by the dynamic range control voltage and a negative feedback voltage to provide a compressed output signal; and

feedback means connected to said dynamic range control means for producing the negative feedback voltage, said feedback means including means for sequentially integrating, inverting and amplifying the output signal from said dynamic range control means to obtain the negative feedback voltage and to feed back said voltage to said dynamic control means.

4,432,237

ULTRASONIC TRANSDUCER

Dieter Schmidt, and Rolf Engler, both of Göttingen, Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft-und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

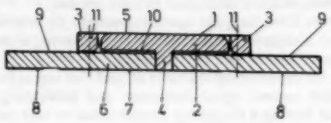
Filed Jan. 25, 1982, Ser. No. 342,085

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103357

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—632 **12 Claims**

1. Ultrasonic measurement transducer in form of an electrical capacitor for measurements of a flow field, comprising: a counter-electrode and a film lying thereon; said film comprising synthetic material metallized on one side; a clamping ring for holding said film, said counter-electrode and film of synthetic material being arranged electrically insulated from each other; a conductor plate with conductor track portions, said counter-electrode and said clamping ring holding said synthetic material film electrically insulated therefrom being fastened to said conductor plate and being electrically connected conductively with a respective conductor track portion provided on said conductor plate.



4,432,238

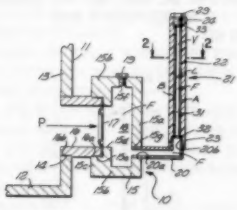
CAPACITIVE PRESSURE TRANSDUCER

Emanuel Tward, Northridge, Calif., assignor to Tward 2001 Limited, Los Angeles, Calif.

Filed Jul. 22, 1982, Ser. No. 400,754

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—724 **9 Claims**



1. A capacitive type pressure sensing transducer assembly comprising:

(a) a transducer housing with walls defining a fluid chamber and incompressible fluid within and filling said chamber;

(b) a pressure sensitive element spanning a port in one wall of said housing, said element interfacing with an applied pressure force to be sensed and measured and being deflectable in response to said pressure force to vary the volume of the fluid chamber of said transducer housing;

(c) a multi-capacitor fluid level sensor formed of a first pair of plate type capacitors having like fixed electrical capacitive value and a second pair of plate type capacitors having like open dielectric spaces in fluid flow communication with the fluid chamber of said housing within which fluid from said chamber is maintained as like variable height fluid columns of dielectric material whereby the electrical capacitive value of said second pair of capacitors varies directly with the increasing or decreasing volume of said fluid chamber and corresponding decreasing or increasing height of said fluid columns in response to a pressure force applied to said pressure sensitive element;

(d) means electrically connecting the first and second pairs of capacitors of said sensor together to form the four capacitive sides of a Wheatstone bridge circuit, the first pair of capacitors connected as two opposing sides of said bridge and the second pair of capacitors connected as the remaining two opposing sides of said bridge;

(e) a source of alternating current of constant voltage and set frequency connected across said bridge circuit to a first set of terminals at opposite corners of the bridge, each of said terminals located between a capacitor of the first pair of capacitors and a capacitor of the second pair of capacitors of said sensor; and

(f) a current detection circuit connected across the bridge to a second set of terminals independent of said first set of terminals and at opposite corners of the bridge, each of said sec-

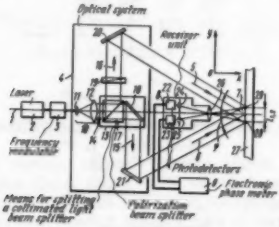
ond terminals located between a capacitor of the first pair of capacitors and a capacitor of the second pair of capacitors of said sensor, said detection circuit including current value measuring and current value indication circuitry for expressing in direct relationship said current value as a pressure force value.

4,432,239

APPARATUS FOR MEASURING DEFORMATION

Anatoly P. Bykov, ulitsa Stroitelnaya, 6, kv. 16, Zhukovsky Moskovskoi oblasti, U.S.S.R.

Filed Dec. 8, 1981, Ser. No. 328,477
Int. Cl.³ G01L *1/24*
U.S. Cl. 73—800 **3 Claims**



1. Apparatus for measuring deformation of the surface of a test specimen comprising:

(a) a laser and an optical system arranged on a common optical axis for forming two light beams intersecting each other and forming an interference pattern;

(b) a modulator for shifting the frequency of light produced by said laser interposed between said laser and said optical system;

(c) a system of markers formed on the surface of said test specimen in the region of intersection of said light beams;

(d) a receiver unit including first and second photodetectors, each of said photodetectors being optically aligned with a corresponding first and second marker of said system of markers; and

(e) an electronic phase meter connected to outputs of said photodetectors for measuring the difference in the phase of electrical signals thereof to determine the relative displacement of the first and the second of said markers and hence the amount of deformation to which the surface of said test specimen has been subjected.

4,432,240

ELASTOMERIC TESTING APPARATUS

John O. Adams, Madisonville, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 2, 1982, Ser. No. 345,171
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—822 **8 Claims**

1. Apparatus for determining the amount of compressive force exerted on an elastomeric material of generally rectangular configuration; comprising in combination:

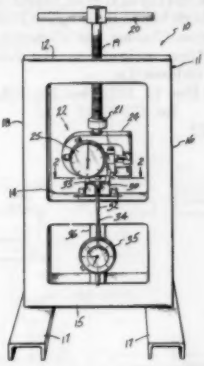
a. a frame;

b. an elongate generally rectilinear elastomeric material retainer connected to the frame having a hollowed out central area adapted to receive and retain at least partially along two sides the elastomeric material during compression;

c. compression means connected to the frame cooperative with the elastomeric material retainer effective to selectively exert a predetermined amount of compressive force on the elastomeric material;

d. compressive force measuring means connected to the frame having a pressure plate contactable with the elastomeric material and cooperative with the elastomeric material retainer to measure the amount of compressive force exerted on the elastomeric material; and

e. deflection measuring means mounted to the frame including a deflector arm and cooperative with the elastomeric material retainer and the elastomeric material to measure



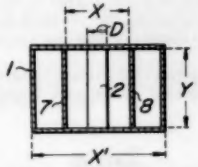
the amount of compression which the elastomeric material experiences as a function of the deflector arm in response to the selective exertion of compressive force, the amount of compression being transmitted as a deflection through the deflector arm.

4,432,241

KARMAN VORTEX TYPE FLOW MEASURING APPARATUS

Toru Kita, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 14, 1979, Ser. No. 103,742
Claims priority, application Japan, Dec. 15, 1978, 53-154104
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **2 Claims**



1. A Karman vortex type flow measuring apparatus comprising a duct through which flows a fluid whose flow rate or flow velocity is to be measured, and a columnar vortex shedding member extending within the duct transversely of the flow direction of the fluid, the flow rate or flow velocity of the fluid being measured by detecting the frequency of the vortex shedding induced by the vortex shedding member, characterized in that planar partitions are disposed within the duct on both sides of the vortex shedding member in parallel with the flow direction of the fluid and with the longitudinal direction of the vortex shedding member, the partitions being arranged such that the following condition is satisfied:

$$3 \leqq X/D \leqq 4$$

wherein X is the distance between the inner surfaces of the partitions and D is the width of the vortex shedding member as measured in a direction perpendicular to the flow direction of

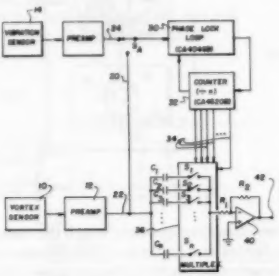
the fluid and to the longitudinal direction of the vortex shedding member.

4,432,242

TUNABLE NOTCH FILTER FOR REDUCING VIBRATION SENSITIVITY FOR VORTEX SHEDDING FLOWMETER GENERATOR

William L. Thompson, Chardon, and Michael S. Willey, Chagrin Falls, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 10, 1981, Ser. No. 329,539
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **5 Claims**



1. A filter circuit for reducing vibration sensitivity in a vortex shedding flowmeter signal generator comprising:

means for providing a vibration signal having a fundamental frequency with a vibration signal period;

means for providing a vortex shedding frequency;

a phase lock loop connected for receiving the vibration signal and multiplying the vibration signal by a selected number;

dividing means connected to an output of the phase lock loop for dividing the vibration signal by the same selected number as the multiplying in said phase lock loop;

multiplexer means connected to the dividing means for sequentially preserving the voltage of each part of the vibration signal period as divided by the selected number in said dividing means, the vibration signal period being divided into a number of increments equal to the selected number; and

means for subtracting each average voltage from the vortex shedding frequency during each respective time increment.

4,432,243

FLOW CALCULATOR WITH VELOCITY CURVE FITTING CIRCUIT MEANS

Francis C. Lowell, and Thomas K. Campbell, both of Falmouth, Mass., assignors to Ocean Research Equipment, Inc., Falmouth, Mass.

Continuation of Ser. No. 16,096, Feb. 28, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 198,119
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.31 **7 Claims**

1. A flow meter for measuring volume of flow in a conduit, said flowmeter comprising

(a) acoustic means for obtaining measurements of fluid velocity along a plurality of paths in said conduit

(b) signal processing means for

(1) fitting said velocity measurements to a general relationship of the form

$$x(x)=a_0+a_1f_1(x)+a_2f_2(x)+\ldots+a_nf_n(x)$$

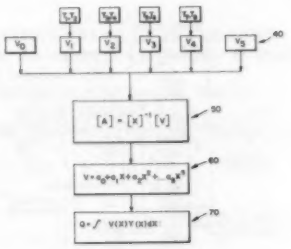
where x represents a position along an axis transverse to the direction of said flow, the "a" values are coeefficients whose values depend on the velocity and its distribution along the x axis and v(x) represents the velocity at that position, by solving for the "a" values in said relationship, and

(2) integrating said relationship according to the formula

$$Q=\int v(x)y(x)dx$$

where y(x) represents the dimension of the flowing fluid transverse to both said axis and said flow and Q is the volumetric flow rate.

7. A flow meter for measuring volume of flow in a conduit, said flowmeter comprising



(a) acoustic means for obtaining measurements of fluid velocity along a plurality of paths in said conduit,

(b) signal processing means for

(1) fitting said velocity measurements to a polynomial expression relating velocity to position along an axis transverse to the direction of said flow, and

(2) forming a product by multiplying said polynomial expression by an expression relating the transverse dimension of said conduit as a function of position along said axis and transverse to the direction of flow, and

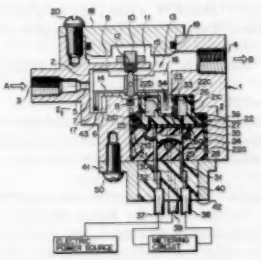
(3) integrating said product over said axis.

4,432,244

FLOW RATE TRANSDUCER

Masami Kataoka, Kariya, and Nobumasa Higo, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 26, 1982, Ser. No. 382,118
Claims priority, application Japan, May 29, 1981, 56-78927
Int. Cl.³ G01F *1/06, 1/08*
U.S. Cl. 73—861.77 **10 Claims**



1. A flow rate transducer comprising:

a housing in which are formed a cylindrical fluid chamber, a fluid inlet substantially tangentially connected to said fluid chamber and a fluid outlet connected to said fluid chamber;

a support portion which is surrounded by an annular guide

groove formed coaxially with said fluid chamber in said housing and communicating with said fluid chamber;

a vane wheel which is rotatably and coaxially supported by said support portion in said fluid chamber;

plate pieces formed on that end face of said vane wheel which are disposed in said guide groove and are arranged circumferentially of said vane wheel at regular intervals;

rotation detecting means disposed adjacent to said guide groove for detecting that each of said plate pieces passes by said detecting means; and

notch-shaped vane wheel speed adjusting chambers formed in said support portion to communicate with said guide groove and said fluid chamber for making the rotational speed of said vane wheel substantially equal to the flow rate of a fluid in said fluid chamber.

4,432,245

GRINDING MACHINE MOTOR WITH A TORQUE SENSOR

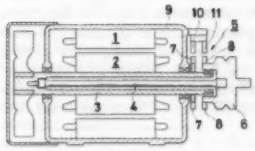
Mitsuro Hattori, Ibaragi; Koosuke Harad, Fukuoka, and Tadahiko Goto, Kita-Kyushu, all of Japan, assignors to Agency of Industrial Science & Technology; Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 244,916

Claims priority, application Japan, Mar. 24, 1980, 55-37273

Int. Cl.³ G01L *3/04*

U.S. Cl. 73—862.32 **2 Claims**



1. A grinding machine motor with a torque sensor, comprising:

a stator;

a rotor rotatable relative to said stator;

a hollow drive shaft rotatably supporting said rotor, the drive shaft defining an axial bore;

a torsion bar disposed in the axial bore of said hollow drive shaft and having two ends, one end of the torsion bar being fixed to said hollow drive shaft and the other end thereof being connected to a pulley for transmitting its rotation to a grinding wheel spindle, said torsion bar having a first portion twistable by a small torque substantially equivalent to the predetermined motor torque just before the grinding wheel touches a workpiece, and a second portion twistable by a large torque in a range substantially equivalent to the predetermined torque range normally encountered in grinding;

means for bringing said second portion into direct engagement with said hollow drive shaft after said first portion has been twisted by the small torque; and

dual-sensitivity detector means for detecting the transmission torque in terms of the twisting angle of said torsion bar, said detector means being capable of detecting the rise in motor torque just before the grinding wheel touches the workpiece by sensing the twisting angle of said first portion of said torsion bar, and of detecting the torque range encountered in ordinary grinding by sensing the twisting angle of said second portion.

4,432,246

DISPLACEMENT AND/OR FORCE MEASURING DEVICE AND METHOD

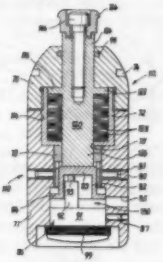
Rodney J. Granat, Caulfield, Australia, assignor to ACI Australia Limited, Victoria, Australia

Filed Dec. 9, 1981, Ser. No. 329,136

Claims priority, application Australia, Dec. 12, 1980, PE6928

Int. Cl.³ G01L *1/04, 5/00*

U.S. Cl. 73—862.53 **14 Claims**



1. A device for measuring the distance moved by an applicator head of a container filling and capping station and, hence, a force applied by the head, the device having a housing member, a plunger member telescopically inter-fitted with the housing member so as to be substantially linearly movable relative thereto, biasing means biasing said members to a rest position, and indicator means mounted on said members; said indicator means having at least one component thereof movable such that, during one stage of relative movement of the members from their rest position against the bias of said biasing means and return to their rest position under said bias, said at least one component is fixed relative to one of said members and movable relative to the other member, and such that during the other stage of that movement said at least one component is fixed relative to the other of said members and movable relative to the one member to thereby provide a measure of the relative movement of the members in one of said stages, and wherein the external form of the device corresponds to a standard container in which a closure member is to be fitted by an applicator head of a container filling and capping machine, such that the device can be inserted upstream from the applicator head in a process line for containers passed through said machine and thereby subjected to the action of the applicator head to obtain a read-out of distance moved or pressure applied by the applicator head.

4,432,247

LOAD CELL HAVING THIN FILM STRAIN GAUGES

Shozo Takeno, Yokohama, and Koichiro Sakamoto, Mishima, both of Japan, assignors to Tokyo Electric Co., Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 323,726

Claims priority, application Japan, Nov. 29, 1980, 55-0168533; Nov. 29, 1980, 55-168534; Dec. 2, 1980, 55-169854; May 21, 1981, 56-77310; May 27, 1981, 56-80602

Int. Cl.³ G01L *1/22;* G01B *7/20*

U.S. Cl. 73—862.67 **14 Claims**

1. A load cell comprising:

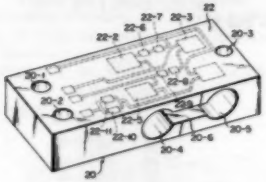
a beam body;

a coating film of heat-resistant insulating resin formed on one surface of said beam body, said coating film having a substantially flat surface; and

a load cell element formed on said substantially flat surface of said coating film;

said load cell element including first and second power source terminals, first and second output terminals, a first strain gauge resistor and a first bridge balancing resistor connected in series between said first power source terminal and said first output terminal, a second strain gauge

resistor and a second bridge balancing resistor connected in series between said first power source terminal and said second output terminal, a third strain gauge resistor connected between said second power source terminal



and said second output terminal, wherein a resistive layer is formed over a pattern region including said first to fourth strain gauge resistors, said first and second bridge balancing resistors and connecting means for connecting these resistors, and a conductive layer is formed on said resistive layer over a pattern area of the connecting means.

4,432,248

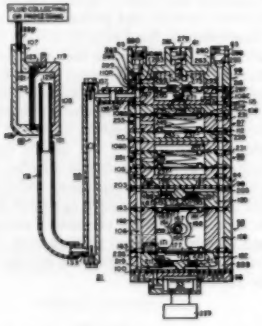
FLUID SAMPLING

Hill S. Lalia, Wayne, N.J., assignor to Gilian Instrument Corporation, Wayne, N.J.

Filed Oct. 29, 1980, Ser. No. 201,823

Int. Cl.³ G01N 1/24

U.S. Cl. 73—863.03 **14 Claims**



1. A fluid sampler including a fluid channel having an inlet branch and an outlet branch, a pump connected to said fluid channel, for conducting fluid from said inlet branch through said outlet branch, means, connected to said fluid channel, restricting the flow of fluid therethrough to a magnitude less than the capacity of said pump, whereby a pressure differential is produced in said channel across said restricting means, and a pressure regulator directly intereconnected between said inlet branch and outlet branch, responsive to said differential, for regulating the quantity of fluid delivered by said pump at said outlet to said magnitude permitted by said restricting means, said regulator including valve means operable to interconnect said inlet branch, said pump and said outlet branch in a closed circuit when the pressure difference between said outlet branch and said inlet branch exceeds said pressure differential so that, under this circumstance, the fluid in said branches is circulated by said pump in said closed circuit, and to interrupt said closed circuit when pressure difference is less than said pressure differential so that, under this latter circumstance, said fluid flows out through said outlet branch.

4,432,249

LIQUID SAMPLING

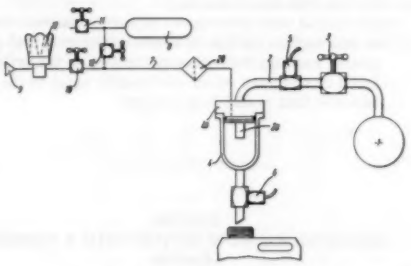
George Levey, 250 Tottington Rd., Bolton, and Peter J. Smith, 20 Ladybridge Ave., Worsley, Manchester, both of England

Filed May 26, 1982, Ser. No. 382,028

Claims priority, application United Kingdom, Jun. 1, 1981, 8116629; Feb. 16, 1982, 8204436

Int. Cl.³ G01N 1/14

U.S. Cl. 73—863.83 **6 Claims**



5. A method of obtaining a sample of liquid from a liquid flow line, said method comprising introducing a purging fluid at a pressure higher than the pressure in the liquid flow line, through second line means, to sample containing means and first line means, causing a volume of sample liquid from the flow line to enter the sample containing means, and supplying a further volume of purging fluid to the sample containing means whereby both purging fluid and sample liquid in excess of a desired amount are discharged into the liquid flow line, opening first valve means in the first line means after introduction of the purging fluid to the sample containing means and the first line means, and subsequently closing the first valve means after the further volume of purging fluid has been supplied, whereby the first valve means is prevented from operating in contact with liquid from the liquid flow line.

4,432,250

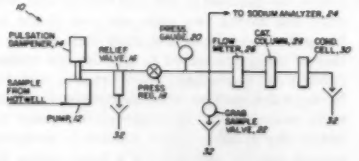
HOTWELL SAMPLING SYSTEM

Leland J. Albrecht, Marlborough, and Richard L. Briere, Hopkinton, both of Mass., assignors to High Voltage Engineering Corporation, Burlington, Mass.

Filed Jul. 6, 1982, Ser. No. 395,330

Int. Cl.³ G01N 1/14

U.S. Cl. 73—864.34 **14 Claims**



13. A steam condensate analyzing system for testing condensate from a power plant hotwell comprising:

(a) positive displacement pump, having an inlet in fluid connection with the condensate and an outlet discharging a volume of condensate per pump stroke;

(b) a pulsation dampener in fluid connection with the pump outlet, said dampener comprising a sealed cannister substantially filled with a flexible, closed-cell material having sufficient volumetric flexibility to substantially dampen the pressure surge of the pump stroke and said dampener being mounted substantially vertically above the pump outlet;

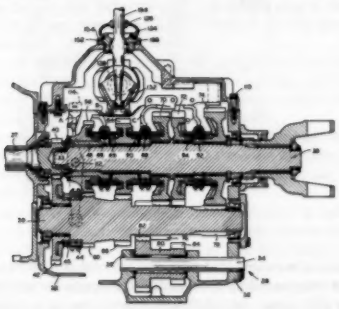
(c) a pressure-regulating valve located downstream of both the pump and dampener for extracting the condensate discharged by the pump;
(d) A relief valve situated between the pump and the regulating valve for discharging excess condensate and relieving pressure; and
(e) a least one, on-line, analyzing component in fluid connection with the regulating valve, whereby steam condensate from the hotwell may be extracted and tested for contaminants.

4,432,251

LOST MOTION TRANSMISSION CONTROL CAMS

Theodore A. Malott, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 29, 1981, Ser. No. 229,402
Int. Cl.³ G05G *9/12, 5/10;* F16H *53/00*
U.S. Cl. 74—337.5 **25 Claims**



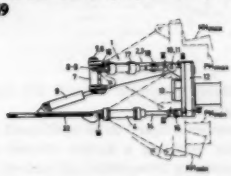
1. A transmission including:
a shift rail having a first position;
a cam follower surface on the shift rail;
a rotatable shaft, the shaft having a neutral rotative position;
a cam follower mounted on the shaft, the cam member having an actuator portion;
the shaft being rotatable a first portion in a chosen direction to a first rotative position and being further rotatable a second portion in the chosen rotative direction to a final rotative position;
the actuator portion being spaced from the cam follower surface during one of the portions of shaft rotation and the actuator portion being in cooperation with the cam follower surface during the other portion of shaft rotation so that the shift rail moves from its first position in a selected direction.

4,432,252

MANIPULATOR FOR CHARGING DEVICES

Eberhard Brücher, Lohweg 35, D-5900 Siegen 21, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,551
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043145
Int. Cl.³ G05G *1/04;* B25J *15/02*
U.S. Cl. 74—469 **3 Claims**



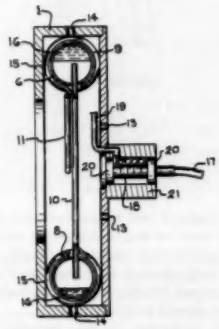
1. An adjustable support with articulated parallelogram linkage, comprising a carrier, a base, parallelogram linkage interconnecting the carrier and the base, and spherical bearings interconnecting the parallelogram linkage and the carrier, the parallelogram linkage comprising two arms disposed in the same horizontal plane and interconnected at their forward ends by spherical bearings to an upper portion of said carrier, the rear ends of the arms being pivotally interconnected for horizontal swinging movement about spaced vertical axes on a hinge plate, means mounting the hinge plate for vertical swinging movement about a horizontal axis on the base, and a fluid pressure cylinder disposed below and parallel to the arms and interconnected at its forward end by a spherical bearing to a lower portion of the carrier and at its rear end by a spherical bearing to the base.

4,432,253

UNBALANCE COMPENSATOR

Jack H. Kerlin, Ann Arbor, Mich., assignor to Balance Dynamics Co., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 255,477, Apr. 20, 1981, abandoned. This application Jan. 25, 1982, Ser. No. 342,450
Int. Cl.³ F16F *15/22;* G01B *7/14*
U.S. Cl. 74—573 R **35 Claims**



1. In a machine having a rotary mass including a spindle shaft containing two axially spaced apart mass portions requiring balancing, an unbalance compensator having a central through-aperture extending between two opposite axial ends thereof, means mounting the unbalance compensator on the rotary mass with the spindle shaft passing through the through-aperture so that one of said mass portions of the rotary mass requiring balancing is disposed adjacent one of said opposite axial ends of the unbalance compensator, and the other of said mass portions is disposed adjacent the other of said opposite axial ends, wherein the unbalance compensator comprises a rotary portion mounted on the rotary mass and a stationary portion, and including an air gap between the stationary and rotary portions allowing the rotary portion to rotate free of contact with the stationary portion, and wherein said stationary and rotary portions comprises respective electrical coils concentrically arranged and inductively coupled.

4,432,254

VISCOUS DAMPER HAVING RIGID PLASTIC STRUCTURE

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

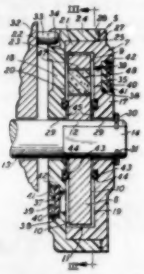
Filed Mar. 23, 1981, Ser. No. 246,901
Int. Cl.³ F16F *15/10*
U.S. Cl. 74—574 **9 Claims**

1. A viscous damper, functioning on the principle of the resistance to shearing of a film of viscous damping medium in a shear film space between relatively parallelly movable surfaces, which damper comprises;
(a) a radially extending member having at least one radially extending and axially facing planar working surface and means for attachment of the member to a first of relatively movable parts to be damped;

(b) an annular housing which defines a working chamber having a radially facing opening through which said member extends into said working chamber, said member having within said chamber a radially extending working planar surface facing axially toward a housing planar working surface in said working chamber in shear film spaced relation;

(c) a viscous damping medium in said chamber providing a shear film of the damping medium between said working surfaces;

(d) means for attaching said housing to a second relatively movable part so that, when said first and second parts move relatively with respect to each other and cause said housing and member and thereby said surfaces to move in relative parallel relation, said shear film will damp the relative movement of said surfaces and, thereby, the relative movement of said housing and member and thus the parts to which they are attached;



(e) annular resilient seal means between and in engagement with said member and said housing adjacent to said opening for preventing leakage of said damping medium through said opening from said working chamber, and said seal means functioning for normally maintaining said shear film spaced relation; and

(f) a bearing projection on said housing projecting from a plane of said housing working surface, less than said shear film spaced relation, toward said planar working surface of said member and normally remaining spaced from said planar working surface of said member, but functioning upon displacement of said surfaces toward one another, as may be caused by external forces on the damper, to limit movement of said surfaces toward one another to the extent of the projecting of said projection from said plane of said housing working surface.

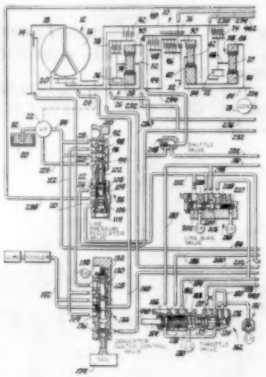
4,432,255

HYDRAULIC CONTROL FOR A POWER TRANSMISSION

August H. Borman, Farmington, and Mark A. Perlick, Brighton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1980, Ser. No. 200,959
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—869 **1 Claim**

1. A hydraulic control for a multispeed transmission adapted to be driven by a throttle controlled engine, said hydraulic control comprising; shift valve means movable between upshifted and downshifted positions for controlling the speed ratio in the transmission including upshift pressure chamber means, downshift pressure chamber means, and downshift bias spring means; speed responsive pressure means for supplying an upshift bias to said upshift pressure chamber means; throttle position responsive pressure means for supplying a pressure which varies when the engine throttle position varies; first modulator pressure valve means in fluid communication between said throttle position responsive pressure means and said downshift pressure chamber means for supplying a variable bias pressure to said downshift pressure chamber means when the pressure of the throttle position responsive pressure means is above a first predetermined level and said shift valve means is in the downshifted position; and second modulator pressure valve means in fluid communication between said throttle position responsive pressure means and said downshift pressure chamber means for supplying a bias pressure to said downshift pressure chamber means when the pressure of the throttle position pressure responsive means is above a second predetermined level, which is higher than said first predetermined level and, said shift valve means is in the upshifted position, the



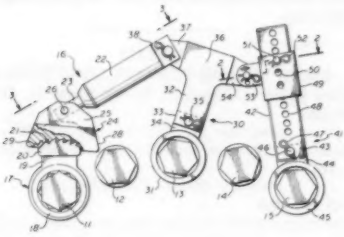
difference between said first and second predetermined pressure levels providing a downshift hysteresis for said shift valve at the shift point, said shift valve means being upshifted by the speed responsive pressure means in said upshift pressure chamber means when the pressure of said speed responsive pressure means is sufficient to overcome said downshift spring means and when the pressure of the throttle position responsive pressure means is below said first predetermined level whereby a constant speed upshift point is provided.

4,432,256

ADJUSTABLE POWERED WRENCH

Thomas Aparicio, Jr., Houston, Tex., and Ron Graham, Norco, Calif., assignors to Gratec, Inc., Norco, Calif.

Filed Sep. 28, 1981, Ser. No. 305,934
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—57.39 **8 Claims**



1. An adjustable powered wrench for turning threaded members comprises

a wrench member adapted to be positioned over a threaded member for applying a torque thereto and having an operating arm for transmission of power,

a fluid operated cylinder and operating piston extending therefrom,

said piston being operatively connected to said wrench operating arm,

a first reaction arm having one end with a pivotal connection thereon adapted to fit over one of said threaded members for support thereon, and having an opposite end pivotally connected to said cylinder for supporting the same,

said first reaction arm being T-shaped including a cylindrical ring at the base thereof providing said pivotal connection to one of said threaded members and having a clevis or tongue member being positioned at opposite ends of the cross arm thereof,

said first reaction arm being removably connected to said cylindrical ring for servicing, one part having a clevis and the other a tongue member, and including a removable pin securing the connection together,

an adjustable anchor member comprising a second reaction arm having one end with a pivotal connection thereon adapted to fit over another one of said threaded members for support thereon,

said second reaction arm having a cylindrical ring at one end providing said pivotal connection to one of said threaded members,

said second reaction arm being removably connected to said cylindrical ring for servicing, one part having a clevis and the other a tongue member, and including a removable pin securing the connection together,

an adjustable sleeve member slidably positioned on said second reaction arm and including means for selectively positioning the same in different positions along the length thereof,

means pivotally connecting said sleeve member to said first reaction arm, whereby adjustment of said sleeve member is operable to adjust the position of said first reaction arm and said fluid operated cylinder relative to said wrench,

said pivoted connection of said first reaction arm to said cylinder comprising said clevis on one and said tongue member on the other and a removable pin securing the same together for pivotal movement, and

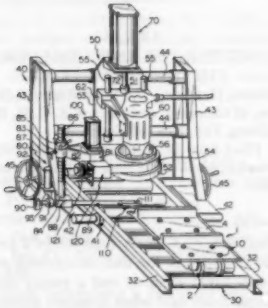
said pivoted connection of said first reaction arm to said sleeve comprises a clevis on one and a tongue member on the other and a removable pin securing the same together for pivotal movement.

4,432,257

SHOE BOLT SECURING AND REMOVING APPARATUS

Kazuyoshi Yamamoto, and Tadashi Sato, both of Sagamihara, Japan, assignors to Caterpillar Mitsubishi Limited, Kanagawa, Japan

Filed May 17, 1982, Ser. No. 379,020
Int. Cl.³ B25B *23/00*
U.S. Cl. 81—464 **7 Claims**



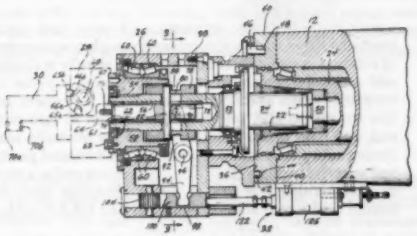
1. A shoe bolt securing and removing apparatus comprising a carriage movable along rails, a mounting framework movably supported on said carriage for movement transversely of said rails, a power driven rotary bolt turning tool mounted on said mounting framework for upward and downward movement, means supported on said mounting framework for moving said bolt turning tool upwardly and downwardly, a nut holder support supported on said mounting framework for upward and downward movement, means supported on said mounting framework for moving said nut holder support upwardly and downwardly and a nut holder supported on said nut holder support below said bolt turning tool for movement back and forth transversely of said rails, said nut holder including a nut receiving portion having the center axis adapted to align with the center axis of said bolt turning tool in a vertical plane in the advanced position of the nut holder.

4,432,258

CONTROLLABLE TOOL FEEDING APPARATUS

John T. Currer, Wauwatosa, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Aug. 26, 1981, Ser. No. 296,501
Int. Cl.³ B23B *3/26*
U.S. Cl. 82—1.2 **1 Claim**



1. A tool head apparatus including a tool head adapted to be removably mounted on a machine tool having a rotary spindle; a cutting tool supported by said tool head for movement in a rectilinear path transverse to the axis of rotation of the spindle; means locking said tool head to the machine tool in a predetermined angular position; means coupling said cutting tool to the machine tool spindle when the tool head is mounted on the machine tool so that said cutting tool rotates with the spindle; moving means connected to said cutting tool and operable when actuated to move said cutting tool in its path of travel in either direction; an actuator rod slidably supported in the tool head for rectilinear movement and coupled to said moving means so that the rectilinear movement of said actuator rod serves to actuate said moving means; a lever pivotally supported in said tool head and coupled to said actuator rod so that pivotal movement of said lever will produce rectilinear movement of said actuator rod; a bar slidably supported in the tool head for rectilinear movement; means coupling said bar to said lever so that rectilinear movement of said bar produces a pivotal movement of said lever; a piston and cylinder mechanism mounted on the exterior of the machine in position to be engaged by said bar when the tool head is mounted on the machine tool in the predetermined angular position for actuating said bar to adjust the position of the cutting tool.

4,432,259

REMOTE CONTROLLED TOOL ARM ADJUSTMENT

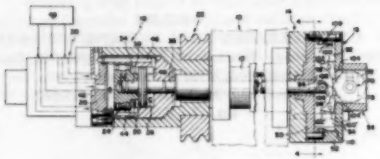
Carl H. Werth, Jr., Bridgeport, Mich., assignor to Werth Engineering, Inc., Bridgeport, Mich.

Filed Jul. 13, 1981, Ser. No. 283,026
Int. Cl.³ B23B *3/26*
U.S. Cl. 82—2 E **8 Claims**

1. In a tool arm assembly having a rotary spindle including a face plate, and tool mounting means supported on said face plate for adjustably shifting a tool in predetermined step-by-step increments radially of said spindle while said face plate is rotating;

the improvement wherein said tool mounting means comprises a bar member supported by said face plate and

extending radially of said spindle, said bar member having a pair of end portions fixedly secured to said face plate and a central portion resiliently coupled to and between said end portions for movement relative to said end portions radially of said spindle, means for fixedly mounting a tool on said central portion of said bar member, screw means operable when rotated to shift said central portion relative to said spindle, bi-directional pawl and ratchet means operable when actuated to drive said screw means in a predetermined increment of rotation, remotely controlled



means for selectively actuating said pawl and ratchet means to drive said screw means through one increment of rotation in either direction while the spindle is rotating, said remotely controlled means comprising a piston rod mounted within said spindle for coaxial movement relative to said spindle, piston means coupled to said piston rod, and fluid pressure supply means for normally maintaining said piston rod in a predetermined neutral position and selectively operable to drive said piston rod in a stroke of predetermined length in either direction from said neutral position to actuate said pawl and ratchet means.

4,432,260

METHOD AND APPARATUS FOR CONTROLLING THE FEEDING OF A BANDSAW BLADE OF HORIZONTAL BANDSAW MACHINES

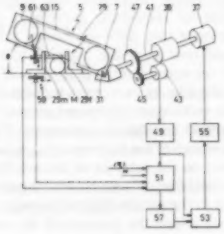
Nobuo Sarurai, Yokohama, and Morimasa Kobayashi, Isehara, both of Japan, assignors to Amada Company, Limited, Isehara, Japan

Filed Jun. 10, 1980, Ser. No. 158,256

Claims priority, application Japan, Jun. 11, 1979, 54-72222; Jun. 11, 1979, 54-72223

Int. Cl.³ B23D *55/08*

U.S. Cl. 83—13 **4 Claims**



1. A method for controlling the cutting rate of a blade of a bandsaw machine, said method comprising the steps of:

(a) driving a bandsaw blade;

(b) positively feeding the bandsaw blade into a material to be cut;

(c) detecting the feeding position of the bandsaw blade in a material to be cut;

(d) generating first signals from the detected feeding position, said first signals defining the detected feeding position;

(e) generating second signals defining the length of the cross-sectional cut in the material at a time corresponding to the feeding position as defined by said first signals; and

(f) controlling the feeding of the bandsaw blade into the material to be cut as a function of the length of the cross-sectional cut defined by said second signals and maintaining a constant cutting rate.

4,432,261

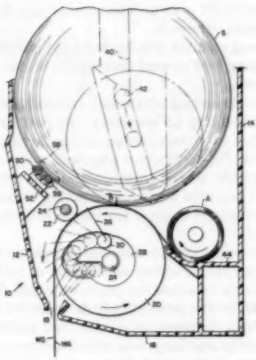
SEVERING WEB PLIES IN MULTIPLE ROLL MATERIAL DISPENSERS

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Dec. 23, 1981, Ser. No. 333,938

Int. Cl.³ B65H *19/06*; A47K *10/36*

U.S. Cl. 83—37 **13 Claims**



1. In a dispenser for rolled flexible sheet material wherein several plies of material fed from multiple source rolls are to be jointly severed, a cut-web dispensing method comprising:

resting one source roll on a dispensing feed roller;

jointly passing web plies over said feed roller from each of said one source roll and another source roll;

continuously applying a retarding force to the exterior of said one source roll at a fixed point remote from the point where said one source roll rests on said feed roller;

jointly cutting said web plies as they pass over said feed roller; and

discontinuing application of said retarding force upon depletion of a predetermined portion of web material from said one source roll.

4,432,262

DRIVING UNIT FOR THE KNIFE HOLDERS OF CROSS CUTTERS OR THE LIKE

Alfred Besemann, Hamburg, and Willi Rehwald, Böblinger, both of Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Apr. 26, 1983, Ser. No. 488,782

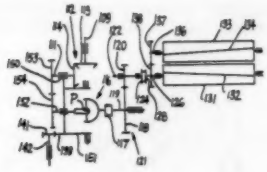
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024603

Int. Cl.³ D06H *7/02*

U.S. Cl. 83—311 **12 Claims**

1. A driving unit for a rotary member in a cross cutter for running webs of paper or the like, comprising an angle drive having a rotary input element and a rotary output element receiving torque from said input element; means for rotating said input element; a universal joint including a rotary input shaft driven by said angle drive and having a first axis and a rotary output shaft driven by said input shaft and having a second axis intersecting said first axis at a predetermined point, one of said shafts being movable with reference to the other of said shafts to thereby change the angle between said axes and said input element having a third axis intersecting said first and

second axes at said point; carrier means rotatably mounting said output element and said input shaft and turnable about said



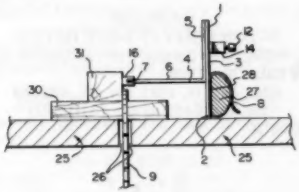
third axis; and means for transmitting torque from said output shaft to the rotary member of the cross cutter.

4,432,263

DUPLICATING FENCE FOR ATTACHMENT TO A RIP SAW FENCE OF A TABLE SAW

Paul G. Kowalchuk, 680 Agnew St., S6V 2P1 Prince Albert, Sask., Canada

Filed Sep. 29, 1982, Ser. No. 427,182
Int. Cl.³ B27B *27/02*
U.S. Cl. 83—438 **8 Claims**



1. A duplicating fence for use as an attachment to a rip saw fence of a table saw that includes a table top and a circular saw extending upwardly therethrough, said duplicating fence comprising, in combination:

(a) a backing member which includes an elongate and straight horizontal bottom edge portion and a vertical and straight rear wall portion;

(b) a guide member which is disposed on a side opposite said rear wall portion of said backing member and which extends outwardly therefrom and which includes an elongate and straight vertical side guide edge portion which is parallel to said rear wall portion and perpendicular to said bottom edge portion; and

(c) attaching and supporting means for fixedly attaching said rear wall portion of said backing member in abutting relationship to said rip saw fence and for supporting said vertical side guide edge portion in a horizontal plane above said circular saw.

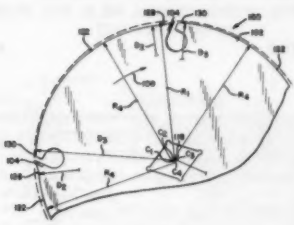
4,432,264

CIRCULAR SAW BLADE

Lewis A. Scott, Lake Oswego, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 292,572, Aug. 13, 1981, abandoned. This application Aug. 3, 1982, Ser. No. 404,850
Int. Cl.³ B27B *33/08*; B23D *61/04*
U.S. Cl. 83—835 **14 Claims**

1. A saw blade comprising a generally circular main body having a plurality of circumferentially-spaced cutter teeth arrayed about the periphery thereof, the outer ends of said teeth being positioned to describe an arc at a preselected first radius during operation of said blade, a tooth having a front surface facing in the direction of rotation of said blade during operation and a rear surface facing in the opposite direction, a peripheral portion of said body intermediate adjacent cutter teeth having a first region adjacent the rear surface of one tooth which is spaced radially outwardly from the center of rotation of the blade a second distance which is less than said first radius, with said peripheral edge extending from said first region toward the forward surface of the following tooth in a



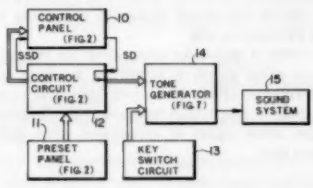
substantially continuous curve to terminate adjacent the forward surface of the following tooth at a second region which is spaced radially outwardly from said center of rotation a third distance which is intermediate said first radius and said second distance.

4,432,265

ELECTRONIC MUSICAL INSTRUMENT CONTROLLING TONE PROPERTIES BY CONTROL DATA SIGNALS

Akiyoshi Oya, and Tomoaki Sekiguchi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 30, 1982, Ser. No. 393,751
Claims priority, application Japan, Jul. 9, 1981, 56-101166[U]
Int. Cl.³ G10H *1/053, 1/18*
U.S. Cl. 84—1.01 **11 Claims**



6. An electronic musical instrument comprising:

a key switch circuitry including playing keys capable of being operated by a player of the instrument for designating respective notes, and including key switches and circuits associated with said keys and producing key identifying signals indicating operated ones among said keys;

tone generator means connected to said key switch circuitry for generating tone signals of the notes as respectively designated by said key identifying signals and having tone properties as determined by control data signals applied thereto;

control data setting means for setting a plurality of control data signals exhibiting values for determining said tone properties; and

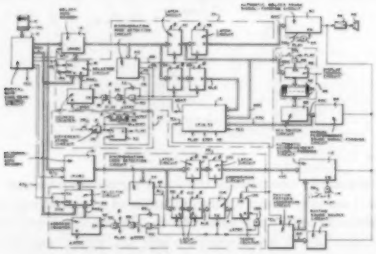
interpolation means connected to said control data setting means for receiving at least one of said control data signals and providing, when the value of the received signal varies from a first value to a second value, an interpolating value which varies gradually from said first value to said second value, said interpolated signal and other control data signals which are not subjected to interpolation being applied to said tone generator means.

4,432,266

AUTOMATIC MUSICAL PERFORMANCE DEVICE CAPABLE OF CONTROLLING THE TEMPO

Akira Nakada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 2, 1982, Ser. No. 394,624
Claims priority, application Japan, Jul. 6, 1981, 56-105273
Int. Cl.³ G10H *1/42*
U.S. Cl. 84—1.03 6 Claims



1. An automatic musical performance device having a plurality of keys, comprising:

means for generating a tempo clock signal having a frequency which determines a tempo of an automatic performance of said device;

store means for storing a set of musical note data supplied from an external recording medium for an automatic performance;

read means for sequentially reading said musical note data from said store means in accordance with said tempo clock signal;

musical tone generation means for generating musical tone signals in accordance with said musical note data read out from said store means;

data generation means for generating reference tempo data;

tempo return instruction means for generating a tempo return instruction; and

tempo control means for controlling the frequency of said tempo clock signal to follow up a tempo of a manual performance effected on said keys and controlling in response to said return instruction the frequency of said tempo clock signal in accordance with said reference tempo data.

4,432,267

ADJUSTABLE NECK-BODY JOINT FOR GUITAR-LIKE INSTRUMENT

Terry L. Feller, 610 Lima Ave., Findlay, Ohio 45840

Filed Apr. 29, 1982, Ser. No. 373,031
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—293 10 Claims

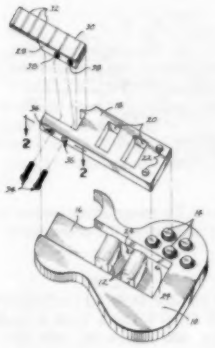
1. A guitar-like instrument comprising, in combination:

a main body portion;

an elongated neck portion having at least two threaded apertures formed transversely therein near one end;

a mounting frame adapted to receive said one end of said neck portion, said frame including respective apertures formed therein for generally aligning with said threaded apertures when said one end of said neck portion is received by said frame;

threaded fastener means extending through each of said frame apertures into cooperation with said threaded apertures for frictionally securing said neck portion to said frame, said fastener means being smaller in diameter than said frame apertures such that said neck portion can be adjusted relative to said frame; and



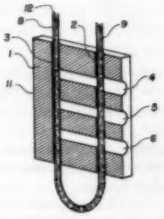
means for integrally securing said frame to said main body portion of the instrument.

4,432,268

DETONATION CUT-OFF DEVICE

Kenneth A. Miller, West Jordan, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Filed Aug. 16, 1982, Ser. No. 408,340
Int. Cl.³ F42B *33/00*; F42D *5/00*
U.S. Cl. 86—1 R 9 Claims



1. A directionally controlled, detonation pressure actuated explosives line detonation cutoff device comprising a body having two through holes extending through the body and at least one blast hole connecting the through hole and extending from one of the through holes to the outside of the body, whereby detonation pressure is directed through the blast hole to sever an explosive line contained in the through holes.

4,432,269

WEAPON SYSTEM

Bernard Castagner, Coupvray par Esbly; Paul Carre, Gif sur Yvette, and Gervais Moise, Choisy le Roi, all of France, assignors to Societe d'Etudes, de Realisations et d'Applications Techniques (S.E.R.A.T.), Paris, France

Filed Sep. 29, 1981, Ser. No. 306,937
Claims priority, application France, Oct. 14, 1980, 80 21901
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.816 12 Claims

1. A weapon system, particularly a light weight anti-tank weapon for use by infantry, said weapon system comprising:

a barrel member for launching a projectile such as a rocket;

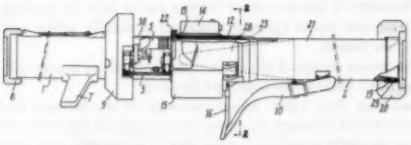
a container member extending rearwardly from said barrel member for containing the projectile prior to firing;

first and second shoulder-piece mountings spaced circumferentially about said container member;

a shoulder-piece selectively connectable to either of said first and second shoulder-piece mountings;

first and second aiming device mountings spaced circumferentially about said barrel member;

an optical aiming device selectively connectable to either of said first and second aiming device mountings;



said shoulder-piece mountings and said aiming device mountings being relatively positioned such that when said shoulder-piece and said aiming device are connected to the respective said first mountings thereof the weapon system is suitable for a right-hand operator, and such that when said shoulder-piece and said aiming device are connected to the respective said second mountings thereof the weapon system is suitable for a left-handed operator.

4,432,270

HYDROSTATIC CONTROL DEVICE PARTICULARLY A STEERING DEVICE

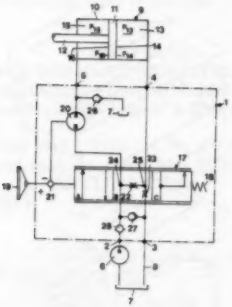
Erik Kyster, Augustenborg, and Svend E. Thomsen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 7, 1981, Ser. No. 261,595

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018792

Int. Cl.³ F15B *15/18*

U.S. Cl. 91—436 **1 Claim**



1. A hydraulic steering control system, comprising, a differential type bidirectional servomotor having a piston with rod and nonrod sides forming smaller and larger effective areas, said servomotor having rod side and nonrod side ports on opposite sides thereof, pump means and tank means, steering control means connected between said servomotor on one side thereof and said pump and tank means on the other side thereof, said steering control means including first and second throttle valve means extending in series between said pump means and said tank means, a control element for said steering control means, said valve means being oppositely operable between opened and closed positions responsive to movement of said control element, directionally operable metering motor means connected to said rod side port of said servomotor and to the junction between said pump means and said first throttle valve means, said servomotor nonrod side port being connected to the junction between said first and second throttle valve means, said first and second throttle valve means having effective respective flow resistances related to the relative areas on the opposite sides of said servomotor piston to equalize the steering forces required to operate said servomotor.

4,432,271

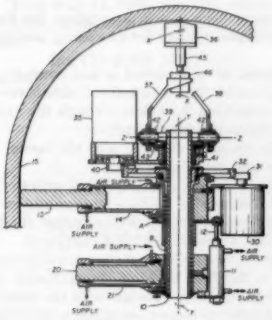
LOCOMOTION UNIT FOR A TOOL SUPPORT ADAPTED FOR PROGRESSION THROUGH PASSAGEWAYS

Timothy H. Wentzell, South Windsor, and Charles B. Innes, Jr., Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 17, 1981, Ser. No. 293,541

Int. Cl.³ F15B *13/06*

U.S. Cl. 91—527 **7 Claims**



1. A locomotion unit adapted to travel between facing surfaces of a passageway in positioning and supporting a special tool which carries out operations within the passageway, including,

a passageway having a pair of facing surfaces,

a shaft oriented to extend its axis lengthwise between the pair of facing surfaces,

a first fixture connected to the shaft at a position intermediate the ends of the shaft,

a first set of fluid pressured cylinders mounted on the first fixture from which pistons are reciprocated radially from the shaft axis into and out of engagement with the facing surfaces,

a second journaled over and slidable along the shaft,

a second set of fluid pressured cylinders mounted on the second fixture from which pistons are reciprocated radially from the shaft axis into and out of engagement with the facing surfaces,

a piston-cylinder structure connected between the first and second fixtures,

a first fluid pressure means connected to the cylinders of the first and second fixtures controlled to alternately extend and retract the pistons of the first fixture relative to the pistons of the second fixture,

a second fluid pressure means for the cylinder of the piston-cylinder connecting the fixtures controlled to alternately move the fixtures toward and away from each other along the shaft axis in coordination with the alternate reciprocation of the pistons of each fixture to cause locomotion of the shaft between the facing surfaces,

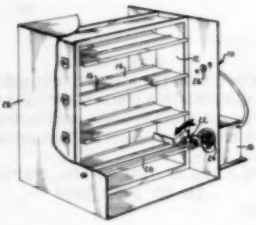
and a tool mounted on an end of the shaft to carry out a predetermined function at a position within the passageway to which the tool is moved by the locomotion of the shaft.

4,432,272

MOTOR OPERATED FIRE DAMPER

Robert M. Van Becelaere, Prairie Village, Kans., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed Nov. 29, 1982, Ser. No. 444,836
Int. Cl.³ F24F 7/00
U.S. Cl. 98—1 5 Claims



1. A protective damper for controlling the flow of fluid through a ventilation conduit for a building, said damper comprising:

a frame adapted to be mounted in said conduit;

a barrier carried by the frame and movable between an open position permitting fluid flow through the damper, and a closed position blocking said flow;

spring means operably coupled with the barrier biasing the latter into said closed position;

electric motor means operably coupled with the barrier and adapted to be coupled with a source of power for moving the barrier to said open position against the bias of said spring means when the motor is energized,

thermal responsive switch means mounted on the frame and exposed to the fluid flowing therethrough, said switch means being operably coupled with the motor means to permit the latter to remain energized to hold the barrier in said flow permitting position when the ambient temperature at the switch is below a predetermined level and to deenergize the motor to permit the barrier to be moved to said flow blocking position when the ambient temperature at the switch is elevated to said predetermined level; and

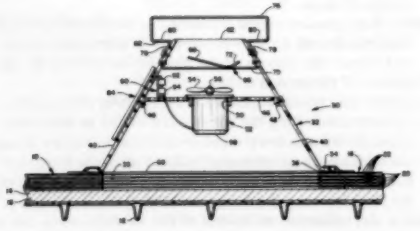
an overriding switch operably coupled with the motor means and adapted to be coupled with said power source, whereby to permit optional energizing of the motor to open the barrier irrespective of operation of the thermal responsive switch to deenergize the motor.

4,432,273

FAN POWERED ROOF VENTING METHOD AND APPARATUS

Gerald J. Devitt, Port Jefferson Station, N.Y., assignor to Revere Products Corporation, Solon, Ohio

Filed Dec. 7, 1981, Ser. No. 327,807
Int. Cl.³ F24F 7/02
U.S. Cl. 98—43 C 7 Claims



1. A flat roof dryer for removing moisture from an insulation cavity formed in a built-up flat roof having a layer of insulation underlying a roof mat having a plurality of plies of roof felt, comprising:

a housing having a lower, flat peripheral base flange adapted for sealingly mounting the housing to the surface of the built-up roof;

a cover means covering the top of said housing to prevent the entry of rain and other foreign matter into the housing;

at least one outlet opening disposed generally below said cover means;

a fan means mounted in said housing to produce a generally upward airflow through said housing;

a one-way flow valve means mounted in the housing and interposed between the cover means and the fan means to permit airflow only in a generally upward direction from said fan means;

an energizing means to automatically energize said fan means; and

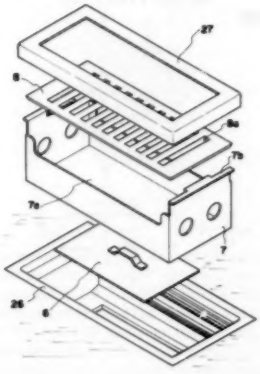
a control means to prevent energizing of the fan means when the temperature in the housing is below a predetermined temperature.

4,432,274

ROASTER

Kiyomitu Kurotaki, 20-8, 1-chome, Jinnan, Shibuya-ku, Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,005
Int. Cl.³ A47J 37/06; F24C 15/20
U.S. Cl. 99—400 7 Claims

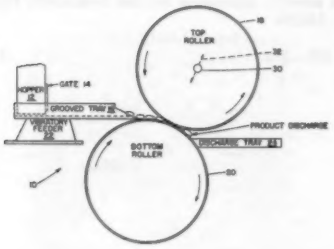


1. A roaster comprising a roaster body having an inner body portion and an outer body portion; a mesh-like cooking plate removably mounted on said inner body portion to place cooking material thereon; a juice receiver containing water therein and disposed under said cooking plate; a gas burner disposed in a spaced manner from said juice receiver to direct a flame toward openings in said juice receiver; a smoke exhaust passage formed between said inner and outer body portions; a water jet type cleaning nozzle disposed at an upper portion of said smoke exhaust passage; an exhaust gas guide passage provided between said cooking plate and said inner body portion so as to communicate with said smoke exhaust passage; a mesh-like filter provided at a lower opening of said outer body portion; and an exhaust casing provided so as to communicate with said outer body portion and also collecting exhaust duct including sucking means and having a filter provided to remove oil out of the cleaning water.

4,432,275
NUT BLANCHING APPARATUS

Gerhard C. Zekert, and Donald K. DeArment, both of Suffolk, Va., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 3, 1980, Ser. No. 202,961
Int. Cl.³ A23N 5/00, 5/01, 12/00
U.S. Cl. 99—625 11 Claims

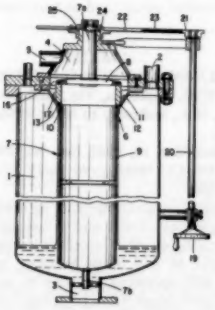


1. A nut blanching arrangement, comprising first and second spaced, adjacent counter-rotating rollers between which the nuts are passed as they are blanched; and a plurality of elastic rings, having rounded cross sections, extending around the outer circumference of each said roller and being positioned adjacent to each other such that circumferentially extending grooves are formed between adjacent elastic rings, said elastic rings on the first roller being radially aligned with respect to the elastic rings on the second roller, said counter-rotating rollers being spaced apart from each other a sufficiently close distance such that nuts passing between the counter-rotating rollers are forced into grooves defined by adjacent elastic rings on one of said rollers while positioned in grooves defined by adjacent elastic rings on the other counter-rotating roller to thereby remove the outer skins of said nuts.

4,432,276
CONTRIVANCE FOR HEATING, PASTEURIZING AND STERILIZING FLUID FOODSTUFFS

Camillo Catelli, Parma, Italy, assignor to Rossi & Catelli S.P.A., Parma, Italy

Filed May 7, 1982, Ser. No. 375,972
Claims priority, application Italy, May 29, 1981, 40055 A/81
Int. Cl.³ A23C 3/02
U.S. Cl. 99—453 10 Claims

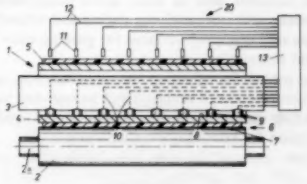


1. Apparatus for heating and/or pasteurizing and/or sterilizing fluid foodstuffs of the type comprising a main chamber furnished with an inlet through which to admit heating fluid and with an outlet through which to draw off the end product, wherein the substance to be heated comes into direct contact with the heating fluid, characterized by the fact that it comprises: a transit chamber having an entry aperture through which to admit the substance and an exit aperture disposed with a vertical axis and opening into said main chamber through which the substance passes from within said transit chamber, said transit chamber being located uppermost of said main chamber; a tubular element disposed coaxially with said exit aperture and part-contained by said transit chamber whilst issuing therefrom by way of same exit aperture thus creating an annular exit collar therewith of predetermined and uniform perimeter width; the inner wall of said transit chamber and the outer wall of said tubular element being of a shape such as to establish an annular passage lying immediately up-flow of said exit collar and determining flow rate through the apparatus and said fluid foodstuff flowing through said main chamber along said outer wall of said tubular element.

4,432,277
PRESSURE ROLLING NIP LINE PRESSURE CONTROL

Werner Hartmann, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,967
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020669
Int. Cl.³ B30B 13/00, 3/04
U.S. Cl. 100—37 5 Claims



1. A method for controlling the line pressure of a pressure rolling nip formed between two rotative pressure rolling rolls of which one has a pressure rolling surface formed by elastically deformable material which is deformed by the nip line pressure while rolling through the nip and thereafter resiliently recovers with consequent heating of the material dependent on the degree of its deformation and recovery, said method comprising measuring the temperature of said rolling surface at a plurality of zones extending along the rolling surface's length, and controlling said line pressure by causing one of said rolls to radially flex locally at each of said zones in the direction of the other roll so as to hold said zones at predetermined temperatures as a function of the measured temperature distribution.

4,432,278
CAN CRUSHING APPARATUS

Walter J. Skipworth, Ashley, Ohio, assignor to Glassco, Inc., Ashley, Ohio

Filed Mar. 23, 1982, Ser. No. 360,831
Int. Cl.³ B30B 9/32, 3/04
U.S. Cl. 100—53 13 Claims

1. Can crushing apparatus comprising:

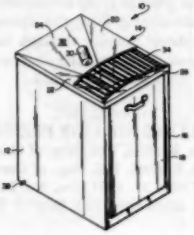
a support housing having a can receiving opening formed within a surface thereof;

first and second disk members having circular outer peripheries and each having mutually inwardly facing convex conical engaging surfaces of slope of about 9° each disk member being rotatable about a respective first and second shaft having an axis of rotation;

disk support means mounted within said housing for rotatably supporting said first and second disk members for driven rotation about said first and second axes, said first and second shafts being supported to angularly orient said axes thereof with respect to each other locating said engaging surfaces to define a wedge-shaped can receiving

region accessible to said can receiving opening, and wherein the included angle between said engaging surfaces is about 33°, said engaging surfaces further defining a continuously diminishing spacing therebetween extending from said can receiving opening to a region of minimum said spacing at a crushed can exit location;

said disk support means further including an upwardly disposed confining member supported adjacent said first and second disk member outer peripheries and extending in



arcuate fashion from said can receiving region toward said exit location, and an input guide component positioned beneath said can receiving region and extending intermediate said engaging surfaces for guiding cans into engagement therewith;

motor means for effecting the simultaneous, synchronized driven rotation of said first and second disk members; and

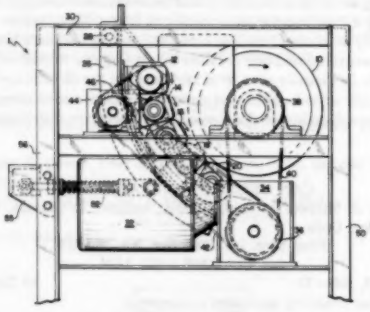
collecting means an opening adjacent said crushed can exit location for receiving crushed cans.

4,432,279

CAN FLATTENER

Jim M. Swendeman, New Braunfels, Tex., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sep. 24, 1982, Ser. No. 422,656
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—171 **8 Claims**



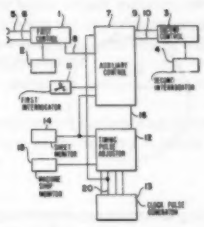
1. a can flattener comprising a rotatable drum, a plurality of rotatable roller assemblies and means for rotating said drum and said roller assemblies, said roller assemblies being mounted in a converging arc with respect to said drum, with the last of said roller assemblies being tangent to said drum, thereby providing a progressively decreasing nip between said drum and said roller assemblies, each of said roller assemblies comprising a plurality of spaced disks, the disks of each roller assembly being interleaved with the disks of its immediate adjacent roller assembly or roller assemblies, the disks of each roller assembly, except the roller assembly which is tangent to said drum, having a chordal portion removed therefrom.

4,432,280

CONTROL SYSTEM FOR SHEET-FED MULTI-COLOR ROTARY PRINTING MACHINES

Volker Eichler, Weinbohla, and Hilmar Trinks, Radebeul, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 29, 1982, Ser. No. 393,356
Claims priority, application German Democratic Rep., Jun. 30, 1981, 231299
Int. Cl.³ B41F *5/02*
U.S. Cl. 101—230 **3 Claims**



1. A control system for changing over a first printing mode of operation to first and second printing mode of operation in a multi-color, sheet-fed rotary printing machine including a plurality of consecutive printing units and a sheet-turning device between the printing units, said system comprising a first control circuit for controlling the operation of functional elements in a first printing unit, said first control circuit including a data input, a data output, a clock pulse input and a clock pulse output; an auxiliary control circuit having a plurality of inputs and two outputs, said clock pulse output of said first control circuit being connected to one input of the auxiliary control circuit; a switching device for delivering a logic control signal according to the selected mode of operation of the printing machine; a second control circuit having a data input and a clock pulse input connected respectively to said outputs of the auxiliary control circuit; a timing pulse generator having a plurality of outputs, one of said outputs being connected to an input of said auxiliary control circuit for delivering a comparison clock signal thereto; and timing pulse adjuster connected between the outputs of said timing pulse generator and said auxiliary control circuit; a sheet-control circuit arranged on said sheet-turning device to deliver a signal corresponding to the presence or absence of a sheet, said signal being applied to said auxiliary control circuit and to said timing pulse adjuster.

4,432,281

SELF-INKING STAMPING DEVICE

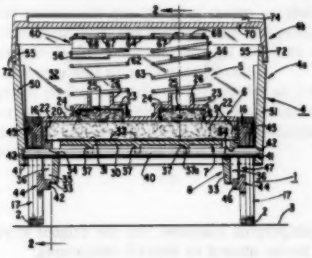
Alexander C. Wall, Nokomis, Fla., and Leonard H. Sculler, Englishtown, N.J., assignors to M & R Seal Press Co., Inc., Roselle, N.J.

Filed Mar. 10, 1982, Ser. No. 356,842
Int. Cl.³ B41K *1/40*; B41F *31/24*
U.S. Cl. 101—334 **13 Claims**

1. In a stamping device comprising an upright hollow frame member having an open lower end to bear against a supporting surface, an operating member interfitting with and displaceable vertically relative to said frame member, spring means normally holding said operating member in an upward position from which by one's hand it can be pressed downward relative to said frame member to a stamping position, an ink pad holder supported by said frame member at a distance above said lower end, a displaceable stamp-carrying platen inside said frame member, and coacting means connected respectively with said platen, said frame member and said operating member for disposing said platen in an inking position at said holder when said operating member is depressed to stamping position;

the improvement wherein said operating member comprises

an upright wall forming a hollow encasement that surrounds and has a height greater than that of said frame member, has a closure fitted removably onto its upper end, and encompasses substantially the entirety of said frame member when depressed to stamping position, whereby the stamping device can be easily grasped, placed for use and operated by a person's hand engaged with opposite sides of the device from any direction and at any location



about the operating member, said encasement wall sloping outward substantially from its bottom to a rim on its upper end, said closure having a skirt portion engaging about said rim and merging with the top of said wall, and spring seating means bridging and fixed to said rim, said spring means being compressed between said ink pad holder and said seating means and thus continuing to be active upon removal of said closure.

4,432,282

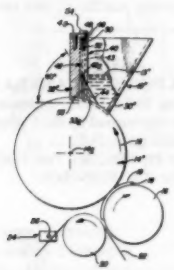
PRINTING PRESS

Edward L. Jurinak, Prospect Heights, Ill., assignor to Apollo Label Company, Worth, Ill.

Filed Apr. 5, 1982, Ser. No. 385,880

Int. Cl.³ B41F *31/04, 31/06*

U.S. Cl. 101—350 **13 Claims**



1. In a printing press for printing with an ink that is adapted to be dried by exposure to ultraviolet light, and including an ink fountain means defined in part by spaced front and rear walls and with a lower, axially elongated, end outlet for feeding said ink by gravity through said lower end outlet directly onto an axially elongated section of a rotatable anilox form roller, whose diameter is larger than the transverse size of said lower end outlet of the ink fountain means, and wherein said anilox roller is adapted, constructed, and arranged to transfer a desired layer of ink through tangent moving engagement, to a printing plate carried on a print cylinder that is rotated in synchronism with said anilox form roller; the improvement comprising, in combination:

doctor blade means, separate from and positioned between the fountain's front and rear walls, and positioned within the ink fountain means, and relative to an upper surface portion of the anilox roller that has already received ink thereonto from said fountain means, the doctor blade means being positioned so as to block further flow of ink onto that upper surface portion of the anilox roller that is adjacent said roller's apex trace region, said doctor blade means including an axially elongated, and downwardly inclined, doctor blade whose axial length is substantially the same as that of the portion of the anilox form roller which is exposed to ink that is being deposited onto the rotating form roller by said roller's exposure to the lower end outlet of the fountain means; and

the axially elongated lowermost edge of said downwardly inclined doctor blade being constructed and positioned to engage the longitudinal outer surface of said rotating anilox roller, so as to remove excess ink from the anilox roller's cylindrical surface, and to return and maintain such excess ink as part of the ink supply of the fountain means.

4,432,283

PROJECTILE FUSE RESPONSIVE TO THE SPINNING MOTION OF A PROJECTILE

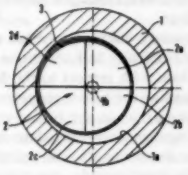
Erich Duffner, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,862

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046620

Int. Cl.³ F42C *15/34*

U.S. Cl. 102—244 **4 Claims**



1. In a projectile fuse of the type comprising a housing, a bore in said housing, a vent arranged substantially concentrically in said bore, and closure means which is openable to expose the vent, the improvement wherein said closure means comprises:

a disk formed of a plurality of sectors and normally disposed in said bore in front of said vent,

said disk being of smaller cross-section than said bore, and

spring means mounted on said disk and acting upon said sectors to retain said sectors together, the size relationship between the cross-sections of said disk and said bore being such that with said sectors retained together by said spring means said vent is covered by a portion of said disk in any given position of said disk in said bore, said spring means being centrifugally responsive to allow said sectors to separate and expose said vent,

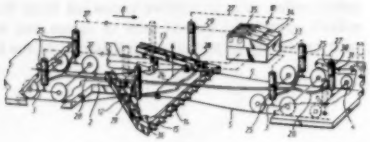
said disk and spring means defining a unit which is freely movable within said bore transversely relative to the axis of said vent in the absence of centrifugal forces.

4,432,284

MOBILE BALLAST CLEANING MACHINE

Josef Theurer, Vienna; Karl Fölser, Linz; Klaus Riessberger, Vienna; Wolfgang Zeppelzauer, Vienna, and Wilfried Glawischnig, Vienna, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jul. 27, 1981, Ser. No. 287,532
Claims priority, application Austria, Jul. 31, 1981, 3981/80
Int. Cl.³ E01B 27/11
U.S. Cl. 104—7 R 20 Claims



1. A mobile ballast cleaning machine mounted on a track for movement in an operating direction and comprising

(a) an elongated frame having two laterally extending sides,

(b) a front undercarriage and a rear undercarriage supporting the frame at respective ends thereof on the track,

(c) track lifting means mounted on the frame,

(d) an endless ballast excavating chain mounted on the frame and extending in an inclined plane with respect to the track, the chain comprising

(1) a course extending transversely of the track and, during operation, therebelow, the endless ballast excavating chain having laterally outermost end regions, and

(2) two lateral courses rising from the end regions in the inclined plane,

(e) power drive means linking the ballast excavating chain to the frame for vertically and transversely adjustably positioning the chain with respect to the frame,

(f) means for cleaning the ballast excavated by the chain and for redistributing the cleaned ballast under the track,

(g) a track sensing element arranged on the frame forwardly of the front undercarriage, in the operating direction, and

(h) apparatus for continuously measuring parameters indicating the track position and any changes therein with respect to a reference system caused by the ballast excavation, and for recording the measured parameters, the measuring and recording apparatus comprising

(1) hydrostatic level measuring devices mounted in the region of the front and rear undercarriages at the laterally extending sides of the frame,

(2) two further hydrostatic level measuring devices transversely spaced apart and mounted on the lateral courses near the laterally outermost regions of the endless ballast excavating chain,

(3) an additional hydrostatic level measuring device mounted in the region of the track sensing element, and

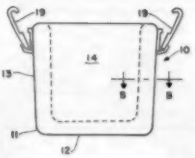
(4) conduit means connected to the hydrostatic level measuring devices for delivering a liquid thereto, the devices comprising means for emitting electrical output signals corresponding to the measured parameters whereby the apparatus is capable of providing a reference base for the parameters superelevation, inclination and lowering of the track level.

4,432,285

BOMB BLAST ATTENUATOR

Carl Boyars, Silver Spring, and David J. Edwards, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 13, 1982, Ser. No. 417,725
Int. Cl.³ F42D 5/04
U.S. Cl. 109—49.5 2 Claims



1. A multipurpose container, for the exigent storage of an explosive device aboard an aircraft, comprising:

a. a substantially cylindrically-shaped receptacle for receiving said device, said receptacle having one open end and a laminated side and bottom wall structure of a plurality of nested one-piece layers of foamed plastic and alternate nested one-piece metallic layers and including a said metallic layer as an outer cladding layer and a said metallic layer as an inner liner layer, said laminated structure preferentially directing an explosive shock wave from said device in the direction of said open end by providing attenuation of said shock wave by shock wave impedance mismatch at the interfaces of said plastic and metallic layers;

b. a foamed plastic lid member for said open end of said receptacle, said lid member providing negligible attenuation of said explosive shock wave, and toward which said shock wave is preferentially directed by said laminated wall structure; and

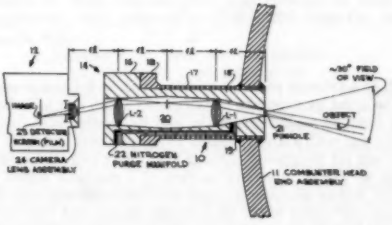
c. latching means on said receptacle and the peripheral edge of said lid for securing said lid to said receptacle.

4,432,286

COMBUSTION PINHOLE CAMERA SYSTEM

Arvel B. Witte, Rolling Hills, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,798
Int. Cl.³ F23N 5/24
U.S. Cl. 110—193 15 Claims



1. In an apparatus for observing reactions within a closed chamber via an externally located viewing means, the improvement comprising:

an optically focused and gas purged pinhole port assembly, said pinhole port assembly being adapted to be mounted in

an associated chamber to be observed and aligned with an associated viewing means,

said pinhole port assembly being adapted to be mounted in an associated chamber such that a portion of said assembly extends into an interior of an associated chamber so as not to be flush with an inner wall surface of such an associated chamber,

said pinhole port assembly including a housing having an opening extending therethrough with a plurality of spaced optical means and gas purging means located so as to direct purging inert gas through one end portion of said opening from between one of said plurality of spaced optical means and an associated chamber,

said optical means functioning to transfer an image of an object in an associated chamber to a point external of said pinhole port assembly for viewing by an associated viewing means.

4,432,287

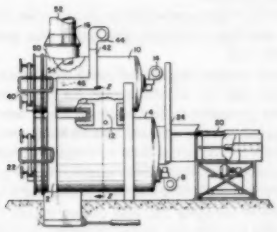
INCINERATOR AND HEARTH CONSTRUCTION THEREFOR

Bonifacio B. Brillantes, Orangeburg, N.Y., assignor to Morse Boulger, Inc., Glen Cove, N.Y.

Filed May 4, 1981, Ser. No. 260,420

Int. Cl.³ F23B 5/00; F23C 9/00; F23G 7/06

U.S. Cl. 110—212 **37 Claims**



1. An incinerator comprising:

a primary combustion chamber,

a secondary combustion chamber communicating with said primary combustion chamber,

a hearth having an upper horizontal surface and a generally horizontal lower surface mounted in said primary combustion chamber,

said hearth having a plurality of vertical passageways engaging said upper surface and said lower surface,

a plurality of generally horizontally disposed air passageways passing through said hearth and each of said air passageways communicating with said supplying air to at least one of said vertical passageways at a location between said upper surface and said lower surface,

a primary burner mounted in said primary combustion chamber below said hearth, and

an exhaust stacking means associated with said secondary combustion chamber and having an opening to the atmosphere and having a base.

4,432,288

COMBUSTION APPARATUS FOR GRANULAR SOLID FUEL

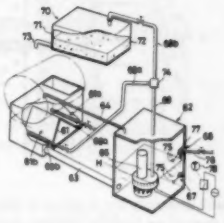
Kiyomi Okada, Ube, Japan, assignor to San Energy Co., Ltd., Ube, Japan

Filed Dec. 3, 1981, Ser. No. 327,258

Claims priority, application Japan, Dec. 9, 1980, 55-172550; Jun. 10, 1981, 56-88030; Jun. 27, 1981, 56-133350

Int. Cl.³ F23D 1/00

U.S. Cl. 110—266 **2 Claims**



1. A combustion apparatus for a granular solid fuel, which comprises in combination:

a horizontal cylindrical combustion enclosure,

at least one circular partition for dividing the interior of said combustion enclosure into a plurality of cylindrical combustion chambers, said partition being provided with communication holes for the combustion gas,

a fuel feed pipe opening into the first of said plurality of combustion chambers,

air feed pipes opening one each into said plurality of combustion chambers,

a combusted gas delivery pipe having one end thereof communicating with the last of said plurality of combustion chambers, and

a dust collector disposed directly below said combustion chambers and made to communicate with the last of said plurality of combustion chambers and receive ashes of combustion falling from the combustion chambers,

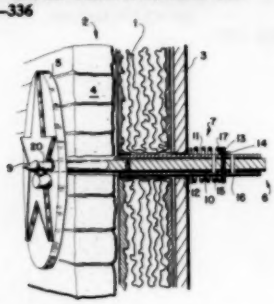
said dust collector being provided with ash removal means comprising a closed tank adapted to communicate with the dust collector through a communication path disposed in the bottom portion of said dust collector and a pressure equalizing pipe disposed in the upper portion of said dust collector, water feed means for feeding water to the closed tank and to the dust collector via the communication path until the water level rises to a prescribed mark, an underwater pump disposed within said closed tank, solid-liquid separation means adapted to communicate with the discharge pipe of said underwater pump, agitation pipes laid within said dust collector, a switch valve for switching the connection of the discharge pipe of said underwater pump between said solid-liquid separation means and said agitation pipe, and a partition board of a triangular cross section for dividing said dust collector into two sections at a position lower than the water level to which the water is supplied to the dust collector, said two sections being provided with agitation pipes and one of the two sections being provided with a communication path leading to the closed tank.

4,432,289

FURNACE BRICK TIE BACK ASSEMBLY

Deumite Norman, P.O. Box 14849, Baton Rouge, La. 70808; James P. Brannagan, 2120 N. Airline Hwy., Gonzales, La. 70737, and Wesley McLane, Rte. 1, Box 485H-1, Prairieville, La. 70769

Filed Jul. 23, 1981, Ser. No. 286,341
Int. Cl.³ F23M *5/00*; E04B *1/62*
U.S. Cl. 110—336 **3 Claims**



1. A tie back assembly for holding in place a loosened brick which form part of an interior furnace wall which comprises:

(a) a hold back plate;

(b) a holder assembly comprising:

(i) a stud shaft attachable at one end to said plate; said shaft has a series of shaft openings positioned along its horizontal axis at its end opposite said end, attachable to said plate;

(ii) a hollow sleeve member through which said shaft can pass, said sleeve fitting through an opening in said wall and extendable past the exterior of said furnace wall; said sleeve member has a series of sleeve openings positioned along its horizontal axis;

(iii) means for fixing the position of said shaft in said sleeve member; said means is a pin that is of length and diameter to allow said pin to pass through both aligned said shaft opening and said sleeve openings; and

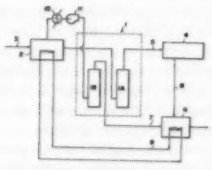
(c) a locking means positioned outside the furnace, but operationally connectable to said shaft for fixing said plate against said loosened brick; said locking means comprises a coil spring fitting over said sleeve member and in contact at one end with the exterior furnace wall surface and in contact at its other end with said pin.

4,432,290

METHOD OF PYROLYZING ORGANIC MATERIAL USING A TWO-BED PYROLYSIS SYSTEM

Yoshiaki Ishii; Naoyoshi Ando; Tsutomu Kume, and Shosaku Fujinami, all of Tokyo, Japan, assignors to The Agency of Industrial Science and Technology, Japan

Continuation-in-part of Ser. No. 199,543, Oct. 22, 1980, Pat. No. 4,344,373. This application Jan. 7, 1982, Ser. No. 337,708
Claims priority, application Japan, Oct. 30, 1979, 54-139271; Oct. 30, 1979, 54-139272; Jan. 13, 1981, 56-2632
Int. Cl.³ F23G *00/00*
U.S. Cl. 110—346 **13 Claims**



1. In a method of pyrolysis of organic material, such as municipal waste, utilizing a two-bed pyrolysis system including a fluidized bed type pyrolysis reactor and combustion reactor and wherein the pyrolysis gas produced in the method is burned and its energy recovered, the improvement comprising the steps of:

recovering the heat of a first combustion exhaust gas produced when the energy is recovered;

heating a fluid heat medium with the heat thus recovered; and

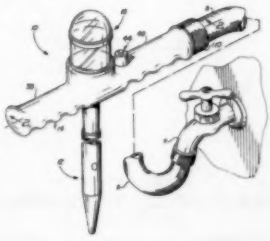
heating organic material prior to the pyrolysis thereof with the heated fluid heat medium, whereby the organic material can be dried before it is pyrolyzed.

4,432,291

UNDERGROUND IRRIGATOR

Dewey D. Shirley, 2223 W. Rovey, Phoenix, Ariz. 85015

Filed Feb. 1, 1982, Ser. No. 344,476
Int. Cl.³ A01C *11/00*
U.S. Cl. 111—7.1 **8 Claims**



1. Apparatus for underground irrigation comprising, in combination:

(a) ground penetrating means for being inserted into ground to be irrigated;

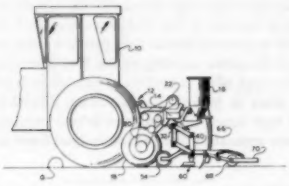
(b) handle means connected to the ground penetrating means for assisting in forcing the latter into ground to be irrigated; and

(c) fluid means associated with the ground penetrating means and the handle means for providing a fluid flow under pressure to facilitate insertion into ground to be irrigated of the ground penetrating means and subsequently a redirected flow to irrigate ground in which the ground penetrating means is inserted, the ground penetrating means including a nozzle providing a hollow, ground-insertion assisting tip, and orifice means disposed on the ground penetrating means adjacent the nozzle for diverting a fluid laterally of the ground penetrating means, the latter forming a central passage communicating with the nozzle and an outer annular passage communicating with the orifice means, the fluid means including valve means connectible to a source of fluid for alternately directing fluid to the central passage and the annular passage, the valve means including the handle means being provided with a fluid receiving void and a pair of passageways each in communication with the void and a respective one of the central passage and the annular passage of said ground penetrating means, a valve element rotatably mounted in the void of the handle means adjacent the passageways thereof and provided with a pair of ports disposed at approximately 90° with respect to one another and selectively alignable with an associated one of the passageways; a bypass means for bleeding a predetermined amount of the fluid to the control passage of said ground penetrating means when said valve means connected to direct the fluid to the annular passage of said ground penetrating means.

4,432,292
FLOATING PLANTER

Kenneth G. Scott, Rte. 5, Tahoka, Tex. 79373

Filed Jan. 18, 1982, Ser. No. 340,331
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—52 **3 Claims**



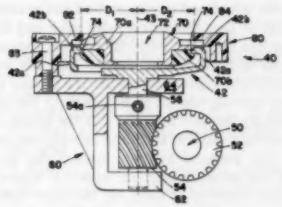
1. In a planter having
a tool bar,
draft means on the tool bar for drafting it through a field to be planted,
a plurality of seed boxes on the tool bar,
tool bar gage wheels on the tool bar to run on the ground for maintaining the tool bar at proper height,
mechanical transmission means connecting the gage wheels to the seed boxes for driving the seed boxes, and for each seed box:
an earthworking implement to move the dry dirt from the seed row,
an opening plow to form a furrow,
a seed chute extending from the seed box and attached behind the opening plow, and
cover means for closing the furrow thus covering the seed in the furrow;
wherein the improved structure for each seedbox comprises:
a subframe with said implement, opening plow, and cover means attached to the subframe,
a parallel motion four-bar linkage connecting the subframe to said tool bar with
(i) a first link operatively connected to the tool bar,
(ii) a third link connected to the subframe, and
(iii) a second and fourth link connected to the first and third link,
a planter gage wheel attached to the subframe in front of the implement,
a clamp attached to the tool bar for each of said seed boxes,
said seed box attached to said clamp,
an adapter beam attached to said clamp,
said first link operatively connected to said adapter beam thus connecting said first link to the tool bar as recited above, and
means for angularly adjusting the first link to the adapter beam.

4,432,293
VERTICAL AXIS ROTARY LOOP TAKER

Joseph M. Arendash, Cleveland, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 205,197, Nov. 10, 1980, abandoned.
This application Dec. 27, 1982, Ser. No. 452,929
Int. Cl.³ D05B *57/08, 57/26*
U.S. Cl. 112—231 **14 Claims**

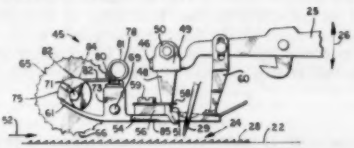
1. In a sewing machine having a vertically extending needle bar, a loop taker mechanism comprising:
a rotatably driven loop taker having an axis of rotation generally parallel to the vertically extending needle bar, the loop taker including an eccentric drive portion spaced from and revolving about the loop taker axis of rotation as the loop taker rotates;
a pair of spaced stop members generally fixed in position relative to the loop taker axis of rotation; and
a non-rotatable bobbin carrier driven by said eccentric drive portion for reciprocating planar movement into engagement against one and then the other of the fixed stops, the stops cooperating to preclude rotation of the bobbin carrier, the bobbin carrier alternately disengaging from one and then the other of the stops to permit free passage of a thread loop about the bobbin carrier, at least one or the other of the stops always engaging the bobbin carrier when the loop taker is rotating, the bobbin carrier planar movement being in a plane perpendicular to said axis of rotation.

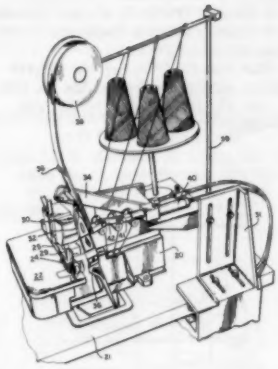


4,432,294
GARMENT FORMING METHOD AND APPARATUS

Elvin C. Price, and Preston B. Dasher, both of Lawrenceville, Ga., assignors to Atlanta Attachment Company, Lawrenceville, Ga.

Filed May 15, 1981, Ser. No. 263,974
Int. Cl.³ D05B *35/06, 97/00*
U.S. Cl. 112—262.3 **7 Claims**





1. A method of forming a garment part and the like comprising progressively moving a base material across a work surface from in front of a sewing station through the sewing station, supporting a wheel and presser foot assembly at a position in front of the sewing station, biasing the wheel downwardly with respect to the presser foot assembly into engagement with the base material, freely rotating the wheel about a horizontal

axis extending across the direction of movement of the base material in response to the movement of the base material toward the sewing station, moving a portion of a length of tape material laterally from beside alignment with the wheel and sewing station to a position in front of the wheel and in alignment with the wheel and sewing station and in contact with the base material so that the wheel rides over and holds the tape material against the base material and the movements of the base material and the wheel tend to feed the length of tape material under the wheel and beneath the presser foot assembly and into the sewing station in unison with the base material, sewing through the base material and the length of tape material at the sewing station, and then moving the portion of the length of tape material feeding toward the wheel laterally away from the position aligned with the wheel and sewing station so that the wheel rides off the tape material and the length of tape material is no longer fed by the base material and wheel into the sewing station.

6. Apparatus for forming garment parts and the like for attachment to a sewing machine that includes a sewing station and feed means at the sewing station to move base material from in front of the sewing station across a work surface through the sewing station, said apparatus comprising a presser foot assembly, a wheel rotatably mounted to said presser foot assembly for positioning in alignment with and in front of the sewing station, said presser foot assembly including a skid extending from said wheel for projecting toward the sewing station, tape feed means including a tape exit end movable back and forth from a position out of alignment with said wheel and to a position closely adjacent and in front of said wheel, whereby as base material is moved across the work surface and beneath the wheel and through the sewing station by the sewing machine feed means the movement of the base material causes the wheel to rotate and the movement of the free end of tape by the exit end of the tape feed means to the position in front of the wheel on the base material results in the wheel rolling over the tape material and the tape material moving with the base material beneath the skid into the sewing station.

4,432,295
PROCESSING METHOD AND APPARATUS FOR RECTANGULAR PIECES OF FABRIC

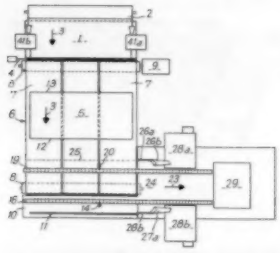
Jean-Pierre Raisin, Troyes; Bernard Helffer, Saint Andre-les-Vergers, and Jean L. Chirouze, Chomerac, all of France, assignors to Institut Textile de France, Boulogne; Agence Nationale de Valorisation de la Recherche (Anvar), Paris and Mecs, Chomerac, all of, France

Filed Jan. 15, 1982, Ser. No. 339,415

Claims priority, application France, Jan. 16, 1981, 81 00832

Int. Cl.³ D05B *35/02, 19/00, 1/08*

U.S. Cl. 112—262.3 **26 Claims**



1. Method for processing a piece of fabric having rear and front parallel edges, of the type which consists in moving the piece in a first direction perpendicular to the two parallel edges, said piece being driven in a second direction substantially perpendicular to the first without the orientation of the edges being altered, and in simultaneously hemming the two edges while the piece is moved in said second direction, method wherein:

(a) the piece of fabric is moved in the first direction until the front edge of said piece reaches a predetermined front position and said front edge is kept in that predetermined position;

(b) while said front edge is so held, the remaining part of the pieces is moved in the first direction until the rear edge reaches a predetermined rear position, and the remaining part of the piece moving in the first direction is stopped and the rear edge is held in its predetermined position;

(c) the piece is moved in the second direction, the edges being kept apart, at a distance which corresponds to the distance separating the predetermined front and rear positions.

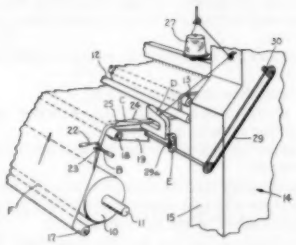
4,432,296
APPARATUS AND METHOD FOR REDUCING WASTE IN TUFTING

Edward A. Grondin, 7 Hiawatha Dr., Greenville, S.C. 29615

Filed Apr. 6, 1982, Ser. No. 366,082

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—266.2 **11 Claims**



1. The method of tufting reducing yarn waste comprising the steps of:

feeding a backing fabric lengthwise toward transversely disposed tufting needles;

folding at least one of the edges of said backing fabric inwardly to form a multi-layered edge;

positioning the layers of said multi-layered edge together for reception of a portion of said backing fabric inwardly of said multi-layered edge by said transversely disposed tufting needles;

forming loops of tufted yarn in said portion of said backing fabric inwardly of said multi-layered edge; and

trimming away said edge of said backing fabric together with adjacent loops of tufted yarn;

whereby excess width portions of said loops are unnecessary.

4,432,297
LOW THREAD SUPPLY MONITOR IN A SEWING MACHINE

Patrice J. Kemmel, Stutensee, Fed. Rep. of Germany, assignor to Pfaff Haushaimaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,781

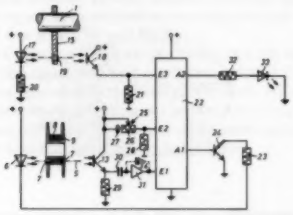
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014753

Int. Cl.³ D05B *45/00, 69/36*

U.S. Cl. 112—278 **14 Claims**

1. A device for monitoring low thread supply in a sewing machine equipped with a rotary hook for lock-stitching and a light emitter delivering light pulses to a light receiver through apertures which are provided in the body of the rotary hook, the bobbin case and the bobbin, comprising, a pulse generator

connected to and controlling the light emitter, and a pulse transmitter connected to said pulse generator and responsive to



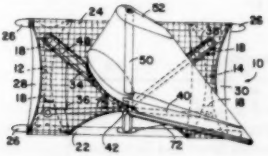
at least one definite position of a drive shaft of the sewing machine for controlling operating time of the light emitter.

4,432,298

HYDROFOIL SAILING CRAFT

Patrick J. Cudmore, Box 1243, Duxbury, Mass. 02332

Filed Oct. 1, 1981, Ser. No. 307,548
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—39 **10 Claims**



1. A rudderless, bidirectionally sailable, hydrofoil sailing craft comprising:

(a) substantially identical first and second, laterally extending, parallel, high aspect ratio, surface-piercing, buoyant hydrofoils, each said hydrofoil having a continuously curved inverted arch configuration, each said hydrofoil having similar streamlined longitudinal edges and a longitudinally extending cross-section which is symmetrical relative to a vertical laterally extending plane, each said hydrofoil having a zero degree angle of attack;

(b) at least two laterally spaced-apart skegs extending downwardly from the convex lower surface of each said hydrofoil, each said skeg acting as a centerboard to resist sideslip;

(c) means for interconnecting and supporting said first and second hydrofoils in a parallel, longitudinally aligned, vertically level relationship;

(d) a mast mounted at its lower end to said interconnecting means at a location which is midway between said first and second hydrofoils and which is laterally offset to the leeward side relative to the longitudinal centerline of said sailing craft, said mast extending upwardly and laterally at an acute angle not exceeding 80° relative to the horizontal, the upper end of said mast being laterally aligned with said lower end of said mast, said mast upper end being laterally offset to the windward side relative to the longitudinal centerline of said sailing craft; and

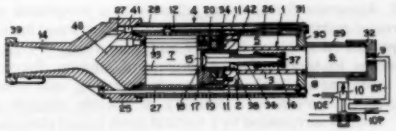
(e) an upper sail frame carried adjacent said mast upper end, an articulated lower sail frame having a relatively small leading member and a relatively large trailing member carried adjacent said mast lower end, a sail supported by said upper and lower sail frames, and control means for pivotally repositioning said sail frames about the mast axis, and for pivotally repositioning said leading and trailing lower sail frame members relative to each other about the mast axis, said sailing craft sailing equally well in both directions under the influence of hydrofoil buoyant lift at low speeds, hydrofoil upper surface hydrodynamic lift at medium speeds, hydrofoil lower surface hydroplaning lift at higher speeds, and increasing canted sail lift at increasing speeds.

4,432,299

IMPULSE NOISE GENERATOR

Ralph N. Smith, Cockatoo Valley, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU81/00043, § 371 Date Dec. 22, 1981, § 102(e) Date Dec. 22, 1981, PCT Pub. No. WO81/03081, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 10, 1981, Ser. No. 339,446
Claims priority, application Australia, Apr. 24, 1980, PE3277
Int. Cl.³ G10K *10/00*
U.S. Cl. 116—137 R **10 Claims**



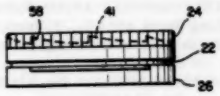
1. The method of generating a noise using a hollow body having freely movable within it a stepped piston in a stepped bore in the body and including a pressure gas inlet to the smaller part of the bore in the body and annular ports through the wall of the larger part of the stepped bore in the body, which method comprises forcing the said piston forwardly in the said bore by applying the gas pressure through a supply line to the small diameter part of the said bore, thereby causing the larger part of the said piston to seal to a pressure chamber at the end of the said larger part of the bore, causing a valve in the said stepped piston to open to bring the pressure chamber to the pressure of the supply, holding the device in readiness for producing the sound by maintaining pressure to the said smaller bore, releasing gas stored in the small bore to cause the gas pressure in the said pressure chamber to act against the larger part of the said piston to drive the piston back to allow the high pressure gas from at least the said pressure chamber to pass with high velocity through the said annular ports in the wall of the said bore, and venting the said gas through a discharge nozzle so as to create a high intensity noise.

4,432,300

PILL DISPENSER WITH SEQUENTIAL DISPENSING AND INDICATING CAP

Esther B. Lyss, 722 S. Meramec, St. Louis, Mo. 63105

Filed Jun. 1, 1981, Ser. No. 268,782
Int. Cl.³ B65D *83/56*; G09F *9/00*
U.S. Cl. 116—308 **16 Claims**



1. A pill dispenser having provisions for sequential dispensing operation, said dispenser being comprised of a cylindrical integral hollow housing constituting a reservoir for pills cooperating with a fill cap and a turn cap, said housing having a top wall bridging a circumferential downwardly extending side wall, said housing being provided with a plurality of circumferential housing openings and a plurality of first ratchet means, said turn cap rotatably seated on top of said housing, said cap being provided with a cap opening and a plurality of

second ratchet means circumferentially arranged on an inner surface of said turn cap, said first and second ratchet means coacting so as to facilitate unidirectional registering of said cap opening with a selected one of said housing openings, indicia on the top wall of the housing corresponding to designate separate times for dispensing said pills, said indicia being positioned between said housing openings to provide a separate time indicia for dispensing in advance of each of said openings, said cap being rotatable in one direction through said ratchet means to progressively present the cap opening in registry with the indicia on the housing and the housing openings.

4,432,301

APPARATUS FOR AFFIXING MARKER TO FABRIC

Nelson P. Diesel, 816 Dutch Mill, Ballwin, Mo. 63011

Continuation-in-part of Ser. No. 51,836, Jun. 6, 1979, abandoned. This application Aug. 21, 1980, Ser. No. 180,114

Int. Cl.³ A41D *1/00;* **A23L** *1/16;* **B65C** *11/04*

U.S. Cl. 118—315 **1 Claim**

1. Apparatus for applying adhesive to a pre-printed paper garment-making marker pre-rolled on a feed roll and having an unprinted back side and a blank end, comprising

means to spray adhesive downward, and to discontinue spraying while the apparatus is operating, said means to spray comprising a plurality of linearly aligned spray nozzles surrounded by a vertical spray tunnel elongated in the direction of such linear aligned nozzles,

feed means including roll support means having an axis of rotation parallel to said linearly aligned spray nozzles said axis being in advance of the area over which they so spray downward, whereby to define a path of travel transverse to said axis of rotation,

take-up roll support means positioned immediately downstream from said roll support means, so in advance, being parallel thereto and at a distance substantially less than the width of either said roll support means, whereby to provide a planar area beneath said means to spray and elongated transverse to the direction in which the marker is so drawn,

said take-up roll support means having an axis below said planar spray area, together with

power drive means coupled to said take-up roll support means, to draw such marker downstream, in such driving sense as to re-roll such marker with its sprayed side presented upward and outward,

whereby upward presentation of the unprinted back side of such marker when in said planar area beneath said spray nozzles, results in re-rolling the marker with its sprayed adhesive side outward, thereby affording it an additional length of travel, before being overlaid, equal to the perimeter so being re-rolled, and whereby on discontinuance of spraying when the unprinted blank end of the marker is reached, continued re-rolling causes such marker blank end to protectively cover the outward presented adhesive sprayed surface.

4,432,302

RESIN IMPREGNATION RING

John R. Farris, Long Beach, and Allan T. Tucci, Orange, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 5, 1982, Ser. No. 374,984

Int. Cl.³ B05C *5/02*

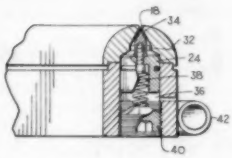
U.S. Cl. 118—410 **3 Claims**

1. An impregnation device for coating roving fibers with a binder comprising:

a hollow 360° ring for distribution of said binder under pressure, said ring having a continuous circumferential slot along said ring;

a circular seal located within said hollow ring to engage and close said slot;

spring bias means located within said hollow ring and contacting said seal to force said seal into engagement with said slot; and means to supply binder under different pressures to said hollow ring said binder forcing said seal out



of engagement with said slot at a higher pressure permitting said binder to flow through said slot from said ring onto the roving fibers.

4,432,303

BIRDBATH HOUSE

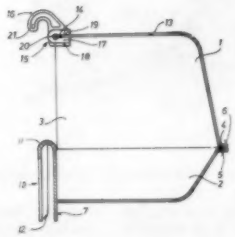
Herbert Ellerstorfer, Flurstrasse 18, Eckenhaid 8501, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,237

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 8116459; Mar. 11, 1982, 8206785

Int. Cl.³ A01K *31/06, 45/00*

U.S. Cl. 119—17 **16 Claims**



1. A birdbath house having a front side with a pass-through opening, hanging hooks on said front side for hanging the house on a cage, and a bowl shaped roof part installed over a bath part, comprising a lip along the lower part of the roof part, means defining a guide and support groove extending around the lip, the bath part is bowl shaped and has a flange type lip along its upper edge removably engaging said guide groove by sliding engagement therein in a direction transverse to the front side, a catch device for releasably retaining said bath part lip in said guide groove comprising at least one cooperating catch recess and projection provided between said guide groove and said bath part lip positioned near the front side to interengage when assembled, said recess and projection having rounded corners and said recess not penetrating through the member on which it is located, the hanging hooks being located on the bath part underneath the pass-through opening, and said bath part lip and said guide groove extend in their transverse dimension outwardly to the side.

4,432,304

FEED STUFF ADMINISTRATION DEVICE FOR MINKS

Bengt D. Johnsson, Fremmenaryd Pl. 2359, S-280 60 Broby, Sweden

Continuation of Ser. No. 254,260, Apr. 15, 1981, abandoned. This application Oct. 26, 1982, Ser. No. 436,723

Claims priority, application Sweden, Apr. 18, 1980, 8002914

Int. Cl.³ A01K *5/00*

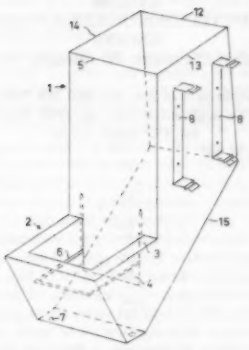
U.S. Cl. 119—18 **4 Claims**

1. In an animal feeding device comprising:

a feed container having a front;

a bowl shaped feeding part connected to the front of said feed container, being adapted to receive feed from said container and present it to an animal to be fed, said bowl having an internal surface wherein said feed accumulates and an upper edge defines an opening through which the animal has access to said feeder;

a tongue extending downwardly from the front of said container and separating said container and said feeding part creating an underflow passage through which feed is dispensed from said container to said bowl shaped feeding part and regulates the position of the upper surface of feed within said bowl relative to said edges;



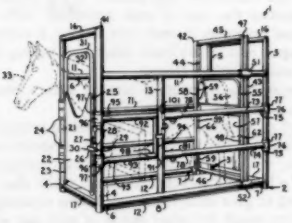
the improvement wherein said feeding device further has a bow means which lies within and substantially conforms with the interior surface of said bowl shaped feeding part, said bow being attached to at least one of said bowl and said tongue and being of a size and location close to the interior surface of said bowl shaped feeding part and in or at some distance above the surface of the feed stuff effective to prevent the animal being fed from removing food from said bowl by pawing it up the sides of the internal surface of the bowl.

4,432,305

ADJUSTABLE LIVESTOCK CHUTE

Michael P. Vernese, Paxico, Kans., assignor to Circle V, Inc., Paxico, Kans.

Filed Mar. 31, 1982, Ser. No. 363,963
Int. Cl.³ A01K *1/06*
U.S. Cl. 119—98 **23 Claims**



1. A livestock chute, which comprises:

(a) a pair of opposite side frames placed in spaced relation and each having a first and a second end;

(b) a first end panel extending transversely between and interconnecting said side frames; and

(c) a second end panel extending transversely between and interconnecting said side frames, said second end panel being longitudinally movable relative to said side frames between said first and second ends thereof and said second end panel including:

(1) a second end panel frame movably mounted on said side frames and forming a gate opening providing access to said enclosure;

(2) a gate swingably mounted on said second end panel frame, said gate being movable between an open position providing access to said enclosure through said gate opening and a closed position substantially blocking said gate opening; and

(3) said latch means for releasably securing said gate in its closed position;

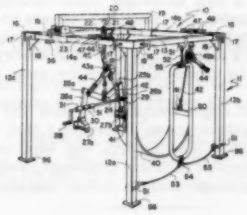
(d) an enclosure for an animal formed by said side frames and said first and second end panels.

4,432,306

PORTABLE HUMANE COW LIFT

Dennis J. Rossa, Rte. 2, Arcadia, Wis. 54612

Filed Aug. 30, 1982, Ser. No. 413,236
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—100 **14 Claims**



1. Apparatus for lifting a down animal comprising:

a. a freestanding frame including a plurality of generally vertical legs connected by a plurality of cross members, said frame being adapted to straddle the down animal with a cross member disposed above each side of the animal, and including connecting means for readily attaching two or more of removable cross members to the legs in sliding engagement therewith, to effect easy assembly and disassembly of the frame, whereby it may be hand-carried in parts to the site of a down animal and there readily reassembled;

b. a sling adapted to be passed under the down animal's thorax, immediately behind its front legs;

c. winch means connected to each end of said sling and to cross members that extend between the legs of each side of the frame, for lifting the front portion of the animal;

d. a hip clamp including a yoke having two downwardly depending arms mounted thereon with means for adjusting the spacing between the arms, the lower end of the arms being adapted to clamp the hind quarters of the animal, engaging its pelvic bone as the spacing between the arms is reduced by said adjustment means; and

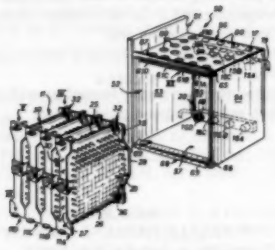
e. hoist means connected to the yoke and to the frame, for lifting the posterior of the animal; said hip clamp being suspended from a cross member which spans the width of the frame between the two cross members adjacent each side of the animal, where said spanning cross member slidingly engages each side of the frame and includes means for both adjusting its position along the length of the frame and for mounting the hoist means so that the hip clamp may be properly positioned adjacent the pelvic bone of the animal.

4,432,307

GAS-OR LIQUID-FIRED HOT WATER BOILER

Pascal Godin, Eu, France, assignor to Societe Industrielle Auer, Paris, France

Filed Jul. 30, 1982, Ser. No. 403,426
Claims priority, application France, Aug. 3, 1981, 81 15027
Int. Cl.³ F22B 5/00
U.S. Cl. 122—14 16 Claims



1. A gas- or liquid-fired hot water boiler for a central heating system, said boiler comprising a housing containing a combustion chamber; a heat exchanger communicating with said combustion chamber and connected between an inlet header and an outlet header adapted to be connected respectively to a return pipe and a supply pipe of a central heating circuit; and gas flue means for exhausting combustion gases, the improvement wherein:

said heat exchanger comprises at least two plug-in exchanger modules, means for coupling each of said modules to each of said headers, and hand-operable latch means cooperable with said exchanger modules for locking said exchanger modules in their plugged-in position.

4,432,308

FUEL FOR COMBUSTION ENGINES

Peter J. Sullivan, Fort Wayne, Ind., assignor to Erad Inc., Fort Wayne, Ind.

Division of Ser. No. 809,913, Jun. 24, 1977. This application Nov. 24, 1980, Ser. No. 210,143
Int. Cl.³ F02M 25/00; F02B 75/12
U.S. Cl. 123—1 A 6 Claims

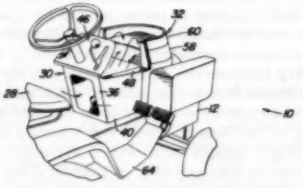
1. A method for operating an internal combustion engine, comprising burning in said engine a mixture consisting of acetone and water in which said mixture contains from 25% to 75% by volume of acetone.

4,432,309

COOLING SYSTEM FOR AIR-COOLED ENGINE

Wayne R. Hutchison, Mayville, and John G. Meylink, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Feb. 9, 1982, Ser. No. 347,121
Int. Cl.³ F01P 5/06
U.S. Cl. 123—41.66 7 Claims



1. In a lawn and garden tractor embodying an air-cooled engine and a cooling system therefor, the engine having a shroud, defining an upwardly opening inlet, and a cooling air fan for drawing air into the inlet, an operator's station located rearwardly of the engine and including a hollow pedestal, a hood extending over the engine and having a rearward end portion closing the top of the pedestal, an improved cooling system, comprising: an upright, air impervious baffle extending forwardly of and along opposite sides of the shroud inlet and having upper and lower edges respectively engaged throughout their length with the hood and the engine; and air inlet means formed in the pedestal.

4,432,310

PARALLEL CYLINDER INTERNAL COMBUSTION ENGINE

Francis E. Waller, Clearwater, Fla., assignor to Leonard J. E. Waller

Continuation-in-part of Ser. No. 265,259, May 19, 1981, abandoned. This application Nov. 12, 1981, Ser. No. 320,213
Int. Cl.³ F02B 75/26
U.S. Cl. 123—58 AB 14 Claims

1. In a multiple cylinder engine comprising:

a. a mainshaft;

b. a cam lobe extending outwardly from the cylindrical periphery of said mainshaft; said lobe having its outer annular periphery substantially cylindrical in shape concentric with said mainshaft and having two opposite sinusoidal surfaces extending near the annular surface of said cam lobe, each of said sinusoidal surfaces having two rises at points 180° from each other and each sinusoidal surface having two reverse rises at points 90° from each of said rises with curved surfaces connecting said rises with said reverse rises on the same sinusoidal surface, the rises in one of said sinusoidal surfaces being opposite the reverse rises in the other of said sinusoidal surfaces and the reverse rises in one of said sinusoidal surfaces being opposite the rises in the other of said sinusoidal surfaces;

c. a multiplicity of pairs of enclosed cylindrical openings having their respective axes parallel to and positioned in a circle around the axis of said mainshaft with the two cylindrical openings in each pair having a common axis and an open end facing each other and having the other ends of said cylinders closed;

d. a corresponding number of pistons with a piston positioned in each said cylinder;

e. a series of connecting rods, the individual connecting rod connecting the two pistons in each respective pair of cylinders, with the length of each said connectng rod being of a length to reach one piston while that piston is positioned to give its cylinder maximum unoccupied volume and to reach the other piston of said pair while said other piston is in a position to give its cylinder minimum unoccupied volume;

f. a multiplicity of cylindrical bearings connected to said connecting rods and each positioned against one or the other of said sinusoidal surfaces so that when either of the pistons attached to the piston rod to which said bearing is attached moves it wll cause a bearing to press against one of said sinusoidal surfaces, said cylindrical bearings being arranged so that two of said bearings are attached to each

connecting rod, spaced from each other and positioned so that the two bearings on a connecting rod are on opposite sides of said cam lobe with one bearing being adjacent to one of said sinusoidal surfaces of said cam lobe and the other of said two bearings being adjacent to the other of said sinusoidal surfaces of said cam lobe, each bearing being positioned so that when the piston to which it is more closely attached is moving toward said cam lobe that bearing will be pressed against the adjacent sinusoidal surface of said cam lobe;

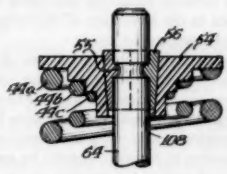
g. a power means for sequentially moving one of each pair of said pistons along the path of its linear axis and thereafter alternately moving the other piston of said pair in the opposite direction, whereby the sequential pressure of said bearings on said sinusoidal surfaces will cause a rotation of the mainshaft on its linear axis;

the improvement wherein the contact areas of said cam lobe surfaces with said bearings are designed so that the area in contact with the outer edge or that edge of the bearing farthest from the axis of said manishaft has a lesser slope in the sinusoidal surface between each said rise and the adjacent reverse rises as compared with the greater slope in the cam lobe surface area in contact with the inner edge of said bearing or that edge of the bearing closest to the axis of said mainshaft, with a gradual increase in said slope progressing from said outer edge contact area to said inner edge contact area, whereby imaginary planes passed through and coincident with the axis of said mainshaft intercept the cam lobe at various angles around the periphery of said lobe, with the cross-section of the bearing contact areas of the cam lobe at the respective rises and reverse rises comprising at the outer surfaces of the cam three sides of a rectangular shape and the respective cross-sections at the midway points between a rise and an adjacent reverse rise comprising three sides of substantially a truncated trapezoid with the bottom line of said trapezoid being in the annular periphery of said cam lobe and with the wider portion of the said trapezoid being the portion of the cam lobe with which the outer edges of said bearings come into contact, with the cross-sections intermediate between said midway cross-section and each said rise cross-section or reverse rise cross-section changing gradually from substantially a truncated trapezoid to said rectangular shape as the respective planes progress from said midway point to a rise or reverse rise.

4,432,311
COMPOSITE VALVE SPRING RETAINER AND PROCESS

Matthew W. Holtzberg, Ringwood, N.J.; Steven J. Henke, Woodridge, Ill.; Lawrence D. Spaulding, Naperville, Ill., and Billy W. Cole, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,324
Int. Cl.³ F01L *3/10*
U.S. Cl. 123—90.67 **32 Claims**



1. A composite engine part, comprising:

a thermoplastic, amide-imide resinous polymeric, valve spring retainer comprising a reaction product of a trifunctional carboxylic acid compound and at least one diprimary aromatic diamine, said amide-imide valve spring retainer having at least one annular flange for abutting against and engaging a compression spring and a neck integrally extending from said flange, said neck and said flange cooperating to define an axial opening for receiving a valve stem and substantially maintaining their shape and structural integrity at engine operating conditions.

20. A process for forming a composite valve spring retainer for use in an engine comprising the steps of:

inserting a core pin in a cavity of a mold providing a die to define generally valve spring retainer-shaped molding chamber;

injection molding a thermoplastic, amide-imide resinous polymer to form a valve spring retainer-shaped blank having a neck, at least one annular flange, and a diaphragm covering an axisl opening, said injection molding including injecting said amide-imide polymer into said cavity at a location generally opposite said core pin to generally fill said molding chamber and substantially minimize knit lines in said amide-imide valve spring retainer-shaped blank;

allowing said amide-imide valve spring retainer-shaped blank to cool below its plastic deformation temperature;

removing said core pin from said die;

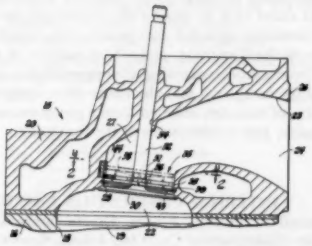
post curing said amide-imide valve spring retainer-shaped blank by solid state polymerization to enhance the strength and integrity of said amide-imide valve spring retainer-shaped blank; and

removing said diaphragm covering the axial opening of said amide-imide valve spring retainer-shaped blank.

4,432,312
ENGINE INTAKE PORT WITH VARIABLE SWIRL VANES

Edward D. Klomp, and David A. Stevens, both of Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1982, Ser. No. 346,565
Int. Cl.³ F01L *3/00*
U.S. Cl. 123—188 VA **2 Claims**



1. The combination in an internal combustion engine of

a cylinder having a closed end,

means defining an intake port opening to the cylinder through the cylinder closed end, the port having an end portion adjacent to the cylinder,

a poppet valve in the port having a head engageable with the port defining means near the cylinder closed end to close communication between the port and the cylinder and a stem connected with the head and extending centrally of the port end portion, the stem being reciprocably supported by the port defining means for movement of the valve longitudinally of the stem into open and closed positions, and

adjustable swirl means in said port end portion adjacent to the valve head, said swirl means comprising means supporting a plurality of flexible vanes in annularly spaced relation around said valve stem in said port end portion and extending in directions generally outwardly from the valve stem and longitudinally along the direction of flow through the port end portion, said vanes being received in

curved slots of slotted guide means disposed within the port, said vane supporting means and said slotted guide means being relatively moveable to flex portions of said vanes to vary their angular relation with respect to the longitudinal axis of the valve, whereby a rotational swirl component of fluid flow within the port is increased or decreased.

4,432,313

ALUMINUM BASE MATERIAL WITH HARD FACING DEPOSIT

Wallace M. Matlock, Highland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 27, 1982, Ser. No. 382,726
Int. Cl.³ F02F *3/10*
U.S. Cl. 123—193 P **27 Claims**

1. An aluminum base material with a hard facing weld deposit thereon, said aluminum base material comprising an aluminum-silicon alloy with at least about 65% aluminum, said hard facing weld deposit consisting essentially of an aluminum alloy including, by weight, (i) about 54% to about 65% aluminum (ii) about 34% to about 17% of materials selected from a group consisting of nickel, manganese, iron, cobalt, and combinations of the foregoing, and (iii) a balance of materials selected from a group consisting of copper, silicon, and combinations of the foregoing, said aluminum alloy comprising at least about 2% of materials selected from a group consisting of iron, manganese, and combinations of the foregoing.

4,432,314

INTERNAL COMBUSTION ENGINE

Emmanouil A. Pelekis, Athens, Greece, assignor to General Supply (Construction) Co., Ltd., Athens, Greece

Division of Ser. No. 180,309, Aug. 22, 1980, Pat. No. 4,321,897.
This application Dec. 2, 1981, Ser. No. 326,478
Int. Cl.³ F02B *53/08*
U.S. Cl. 123—238 **17 Claims**

1. Apparatus for combusting fuel with a compressible oxidizing gas to produce combustion gases, the apparatus comprising:

compressor means for increasing the pressure of the oxidizing gas,

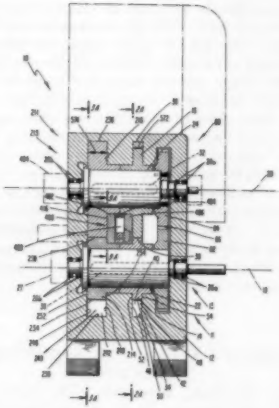
a housing having at least one chamber for combustion situated herein, and further including (i) intake means communicating with said compressor means for admitting to said chamber the compressed oxidizing gas and (ii) exhaust means for releasing combustion gases from said chamber;

expander means communicating with said exhaust means for decreasing the pressure of the combustion gases, wherein at least said expander means includes cooperating rotor means for forming a gas-tight region in the shape of a segment of an annulus, a portion of said region being separately confineable, the volume of said region portion being variable only in the tangential direction, the pressure within said region portion changing when the volume of said region portion is varied;

means for introducing fuel into said combustion chamber for combustion with said compressed oxidizing gas;

wherein the exhaust means further includes exhaust valve means for intermittently releasing combustion gases to the expander means at predetermined intervals during each combustion cycle, said exhaust valve means including a valve member pneumatically moveable alternately into a closed and an open position, said exhaust valve means further including pneumatic control means for initiating movement of said valve member to said open position when said expander rotors are in a predetermined angular position;

wherein said intake means includes an intake valve for admitting the compressed oxidizing gas to the combustion chamber during a second predetermined interval during each combustion cycle, said intake valve including an intake valve member pneumatically moveable alternately



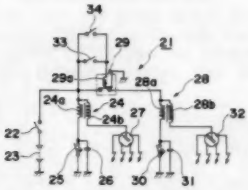
into closed and open positions and wherein said compressor means includes means for activating said intake valve means prior to the activation of said exhaust valve means during each combustion cycle;

said compressor means including a pair of cooperating rotors synchronized with said expander rotors, one of said compressor rotors having a vane; wherein said exhaust valve pneumatic control means includes a control channel in flow communication with said compressor means, said communication being interruptable by said vane whereby movement of said valve member to an open position is initiated during each combustion cycle; wherein said intake valve is openable by the gas pressure ahead of said compressor vane and closeable by the gas pressure behind said compressor vane; and wherein said intake valve means and said exhaust valve control channel are positioned adjacent to one another with said intake valve means being located upstream with respect to said exhaust valve control channel in the direction of travel of the vane of said compressor rotor.

4,432,315
IGNITION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Yasuyuki Morita, and Hiroyuki Oda, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 20, 1981, Ser. No. 294,507
Claims priority, application Japan, Sep. 1, 1980, 55-121631
Int. Cl.³ F02P *1/00, 3/02;* **F02M** *7/00, 25/06*
U.S. Cl. 123—310 **8 Claims**



1. An ignition arrangement for an internal combustion engine which comprises:

a cylinder head forming a combustion chamber together with a cylinder block;

a guide wall formed to extend into said combustion chamber along part of an outer periphery of an intake valve seat and having a first guide surface for causing an air-fuel mixture taken in from an intake port to swirl in a circumferential direction of the combustion chamber, a second guide surface formed to confront an exhaust valve seat for an exhaust port and also to extend into said combustion chamber, and a third surface connected between said first and second guide surfaces;

a first ignition plug provided between said intake port and exhaust port so as to confront said guide wall;

a second ignition plug provided on said second guide surface of said guide wall; and

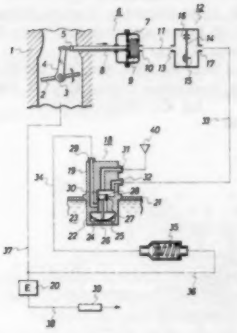
electrical circuit means for causing said first ignition plug to function over the entire engine operating range and for causing said second ignition plug to function only in a predetermined engine operation range where engine knocking is apt to occur.

4,432,316
COLD HC EMISSION CONTROLLING DEVICE FOR AUTOMOBILE EQUIPPED WITH CATALYST TYPE DISPOSAL SYSTEM

Tamotsu Ogita, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 49,988, Jun. 19, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,051
Claims priority, application Japan, Jul. 10, 1978, 53-83007
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—328 **5 Claims**

1. A cold HC emission controlling apparatus for use in an automobile equipped with a catalytic type disposal system, the apparatus comprising a deceleration emission control device having a delaying rod positioned to be moved into and out of engagement with a throttle valve lever in a carburetor of an engine of the automobile, a vacuum control device for operating said deceleration emission control device through a vacuum-transmitting valve; whereby said vacuum-transmitting valve operates said decelerating emission control device; said vacuum control device comprising a bimetal temperature sensitive actuating member and a change-over valve operatively connected to said bimetal member for moving from said vacuum transmitting valve from a position in which said vacuum control device is put in communication with a vacuum source to a position in which said vacuum control device is put in communication with the atmosphere both in said vacuum-transmitting valve, means to locate at least that portion of said vacuum transmitting valve housing said bimetal member directly in the coolant flow stream in the cooling water jacket of

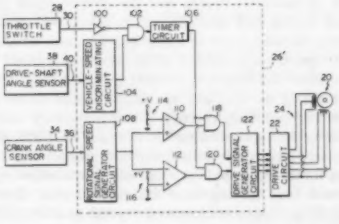


the engine, and a vacuum check valve positioned between said vacuum source and said vacuum-transmitting valve.

4,432,317
METHOD AND APPARATUS FOR CONTROLLING THE IDLING ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

Takahide Kawamura, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 14, 1981, Ser. No. 283,196
Claims priority, application Japan, Jul. 16, 1980, 55-96244
Int. Cl.³ F02P *1/04, 3/00;* **F02M** *3/00*
U.S. Cl. 123—339 **16 Claims**



1. A method of controlling the idling rotational speed of an internal combustion engine by adjusting idle air flow thereto, said method comprising the steps of:

generating an idling state signal when said engine is in a predetermined idling condition;

generating a rotational speed signal related to the actual rotational speed of said engine;

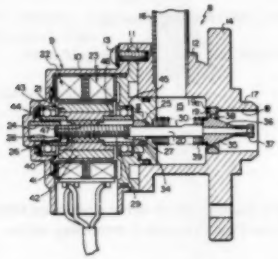
after a predetermined period of time after said idling state signal is generated, comparing said rotational speed signal with upper and lower limit speed signals to generate a control signal which indicates a change in idle air flow to the engine to maintain the actual rotational speed of said engine within a desired range; and

adjusting the idle air flow to the engine in response to said control signal.

4,432,318
DEVICE OF CONTROLLING THE IDLING SPEED OF AN ENGINE

Mamoru Kobashi, Aichi; Shinichiro Tanaka, Susono, and Hideo Saji, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota

Filed Dec. 30, 1981, Ser. No. 335,819
Claims priority, application Japan, May 19, 1981, 56-74104
Int. Cl.³ F02D 11/10
U.S. Cl. 123—339 6 Claims



1. A device of controlling the idling speed of an engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, and a control valve arranged in the bypass passage, said device comprising:

a step motor actuating the control valve and comprising a stator which has exciting coil means and a plurality of spaced pole pieces polarized by said exciting coil means, and a rotor having polarities the pitch of which is two times the pitch of the pole pieces;

first means for detecting the engine speed to produce an output signal indicating the engine speed;

second means for detecting the operating condition of the engine to produce an output signal indicating that the engine is operating in an idling state, and;

an electronic control unit operated in response to the output signal of said first means and the output signal of said second means and exciting said exciting coil means for rotating the step motor in a rotating direction wherein the engine speed approaches a predetermined desired idling speed when the engine is operating in an idling state and for stopping the exciting operation of said exciting coil means and retaining the step motor stationary when the engine speed becomes equal to the desired idling speed,

wherein said electronic control unit comprises a first waiting means for exciting said exciting coil means when a predetermined first waiting time has elapsed after the idling speed of the engine is increased beyond or reduced below said desired engine speed.

4,432,319
FUEL INJECTION CONTROL SYSTEM FOR A FUEL INJECTION PUMP

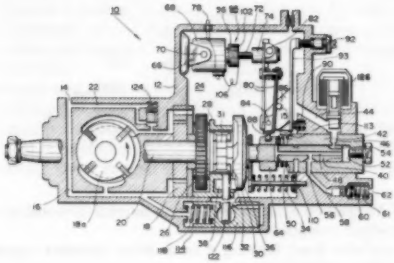
Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 23, 1981, Ser. No. 246,620
Claims priority, application Japan, Mar. 26, 1980, 55-39979[U]; Oct. 31, 1980, 55-152022
Int. Cl.³ F02D 31/00
U.S. Cl. 123—357 37 Claims

1. In a fuel injection control system for a fuel injection pump of an internal combustion engine comprising:

(a) an electric actuator for controlling the fuel injection rate of the pump, the actuator being responsive to a command for taking an operational position corresponding to the command; and

(b) a position sensor including a multi-turn potentiometer coupled to the actuator for sensing the operational position of said actuator, the position being indicated as a varying resistance at a slider of the potentiometer so that there is derived at the slider a feedback control signal corresponding to the actuator position, the potentiometer

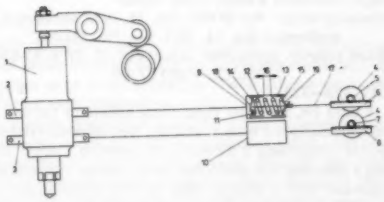


having first and second segments over which the slider moves, the first segment having a first rate of change of resistance corresponding to the fuel injection rate in a range from zero to a fuel injection rate required under full load, the second segment having a second rate of change of resistance, the first rate of change being different from the second rate of change in a fuel injection range extending from the rate required under full load to the rate required during starting of the engine.

4,432,320
CONTROL EQUIPMENT FOR ADJUSTING THE MOMENT OF FUEL INJECTION AND/OR AMOUNT OF FUEL SUPPLIED BY A FUEL INJECTION PUMP, FOR INTERNAL COMBUSTION ENGINES

Georg Brasseur, Vienna; Gerhard Lehner, Hallein; Peter Herzog, Hallein; Heinz Rathmayr, Hallein, and Theodor Stipek, Hallein, all of Austria, assignors to Friedmann & Maier Aktiengesellschaft, Hallein, Austria

Filed May 17, 1982, Ser. No. 378,728
Claims priority, application Austria, Jun. 10, 1981, 2585/81
Int. Cl.³ F02D 31/00
U.S. Cl. 123—357 11 Claims



1. Control apparatus for a fuel injection pump for an internal combustion engine, said apparatus comprising independent control means for changing the timing of fuel injection and for changing the quantity of fuel injected, at least one of said control means including an adjusting member, an electrical servomotor, connecting means connecting the servomotor with the adjusting member for adjusting the position of the adjusting member in either of two directions, said connecting means including a mechanical energy accumulator, said accumulator comprising a pre-stressed compression spring through which adjusting force is transmitted from the servomotor to

the adjusting member in either of two directions, the spring being disposed between two collars which are mutually movable relative to each other, the spring having opposite ends engageable with the collars, and abutment means for limiting the maximum distance between the collars.

4,432,321

FUEL INJECTION PUMP DEVICE FOR INTERNAL COMBUSTION ENGINE

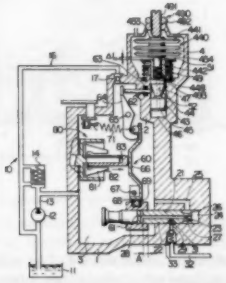
Yasushi Matsuda, Anjo, and Shizuo Kawai, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 19, 1981, Ser. No. 312,915

Claims priority, application Japan, Oct. 22, 1980, 55-151242[U]

Int. Cl.³ F02D *1/02*

U.S. Cl. 123—380 **4 Claims**



1. A fuel injection pump device for an internal combustion engine, comprising:

an injection pump for forcedly delivering fuel into the engine;

means for sensing atmospheric pressure to continuously generate a mechanical correcting signal in response to change in the atmospheric pressure, said sensing means including a bellows expandable and contractible in response to change in atmospheric pressure in order for at least one end of said bellows to move to generate said correcting signal;

means operative in response to the correcting signal for adjusting the amount of liquid fuel delivered by said pump into the engine so as to increase and decrease the amount of fuel in accordance with the increase and decrease in atmospheric pressure, respectively, said adjusting means including an adjusting member associated with said pump and a linkage mechanism connecting said sensing means to said adjusting member for transmitting the correcting signal through said linkage mechanism for adjusting the amount of fuel delivered by said pump into the engine;

said sensing means further including a rod connected to said one end of said bellows for movement therewith and having a profile surface, said linkage mechanism continuously engaging with said profile surface, and means for floatingly supporting an assembly of said bellows and said rod;

signal-transmission limiting means for limiting the transmission of the correcting signal from said sensing means to said adjusting means such that the correcting signal from said sensing means is allowed to be transmitted to said adjusting means within a first range in which the atmospheric pressure is below a predetermined level, but is prevented from being transmitted to said adjusting means within a second range in which the atmospheric pressure is above said predetermined level, said rod of said sensing means being connected in a lost-motion manner to said one end of said bellows, said signal-transmission limiting means comprising a predetermined gap between said one end of said bellows and rod and a stopper engaging with said the other end of said bellows to maintain said predetermined gap between said one end of said bellows and said rod, the change in the atmospheric pressure within said second range causing said one end of said bellows to move within said predetermined gap, said one end of said bellows engaging with said rod when the atmospheric pressure reaches said predetermined level, and the first change in the atmospheric pressure within said first range causing said rod to move.

4,432,322

METHOD AND SYSTEM FOR CONTROLLING IGNITION TIMING IN A MULTICYLINDER INTERNAL COMBUSTION ENGINE

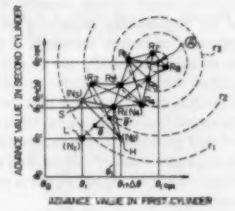
Shingo Inoue, Anjo; Toshiharu Iwata, Aichi, and Yasuhito Takasu, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 30, 1982, Ser. No. 403,816

Claims priority, application Japan, Aug. 1, 1981, 56-120026; Sep. 9, 1981, 56-142004; Sep. 11, 1981, 56-144435

Int. Cl.³ F02P *5/04*; F02D *5/00, 1/04*

U.S. Cl. 123—416 **28 Claims**



1. A method, in a multicylinder internal combustion engine, for obtaining the optimum combination of ignition timings for the individual cylinders, comprising the steps of:

(a) detecting at least one engine running condition parameter;

(b) selecting a group of combination of ignition timings, each combination comprising ignition timings for the individual cylinders of the engine, which timings are determined in accordance with the running condituon parameter;

(c) successively operating the engine by the combinations of ignition timings for a predetermined period;

(d) detecting, at each period, a parameter value corresponding to the engine output characteristic;

(e) determining, by comparing the detected parameter values obtained at the combinations in said group, the combination of ignition timings θ_{min} producing an output characteristic most distant from the optimum output characteristic;

(f) calculating, by using a predetermined formula, a new combination of ignition timings θ_{new};

(g) operating the engine at the new combination of ignition timings for the predetermined period;

(h) detecting the engine output characteristic parameter value, obtained in the operation in step (g);

(i) substituting, in said group of combinations of ignition timings in (b), the new combination of ignition timings θ_{new} for the combination of ignition timings θ_{min}; and,

(j) repeating the above-mentioned steps (e) through (i) so that the new combination of ignition timings progressively approaches the single combination of ignition timings.

4,432,323

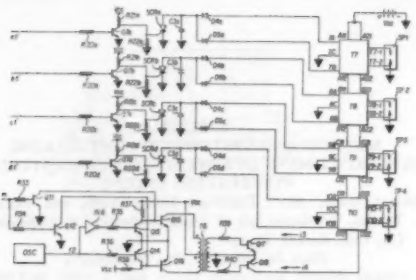
IGNITION SYSTEM

Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 268,889, Jun. 1, 1981, Pat. No. 4,382,430. This application Jan. 4, 1983, Ser. No. 455,574

Int. Cl.³ F02P 1/00

U.S. Cl. 123—427 3 Claims



1. An ignition system for an internal combustion engine, comprising:

crankshaft position sensor means coupled to a crankshaft of said engine for sequentially supplying an output signal to each of a plurality of output terminals in synchronism with the rotation of said crankshaft, one of said output terminals being associated with each cylinder of said engine;

a plurality of switch means, each of said switch means being coupled to receive said output signal from one of the output terminals of said position sensor means for coupling a first and second output terminal of said each of said switch means to ground each time said output signal is received from said position sensor means;

ignition timing generator means coupled to receive said output signal from each of said output terminals of said position sensor means for integrating over time each of said output signals appearing at each of said output terminals of said position sensor means and for generating an ignition pulse during the period of each output signal received from said position sensor means, said ignition pulse beginning when the results of each of said integrations over time reaches a first predetermined value and ending when the results of each integration reaches a second predetermined value;

oscillator means for producing an AC output signal;

control means coupled to receive said AC output signal from said oscillator means and coupled to receive said ignition pulse generated by said timing generator means for alternatingly grounding a first and second output terminal of said control means in synchronism with said AC oscillator output signal during the period of said ignition pulse;

a plurality of high voltage generator means, one of said high voltage generator means being associated with each cylinder of said engine, each of said high voltage generator means being coupled to said first and second terminals of one of said switch means and coupled to said first and second output terminals of said control means for generating a high voltage signal at an output terminal when said first and second terminals of said switch means are grounded simultaneously with the grounding of said first output terminal or said second output terminal of said control means;

a plurality of spark plug means, one of said spark plug means being associated with each cylinder of said engine, each spark plug means being coupled to receive the high voltage output of one of said high voltage generator means for producing an arc upon receipt of said high voltage output.

4,432,324

AIR-FUEL RATIO CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

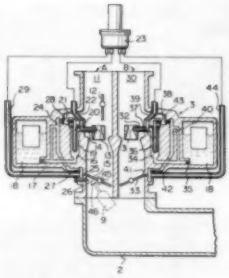
Norikatsu Ishikawa, Mishima; Haruyuki Obata; Takao Tate, both of Susono; Toshio Tanahashi, Susono, and Hiromi Otsuki, Anjo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Apr. 1, 1982, Ser. No. 364,455

Claims priority, application Japan, Apr. 8, 1981, 56-51747; Apr. 8, 1981, 56-51748

Int. Cl.³ F02B 33/00; F02M 7/00

U.S. Cl. 123—438 16 Claims



1. An air-fuel ratio control device of an internal combustion engine having at least one cylinder, an intake passage and an exhaust passage, said device comprising:

a carburetor arranged in the intake passage and having a float chamber, a main nozzle, a main fuel passage connecting said float chamber to said main nozzle, a main air bleed passage connecting said main fuel passage to the atmosphere, a slow fuel port, a slow fuel passage connecting said float chamber to said slow fuel port, a slow air bleed passage connecting said slow fuel passage to the atmosphere;

valve means having a first valve arranged in said slow air bleed passage for controlling the flow area of said slow air bleed passage, a second valve arranged in said main air bleed passage for controlling the flow area of said main air bleed passage, and an electromagnetic device common to said first valve and said second valve and simultaneously actuating said first valve and said second valve while maintaining the flow area of said slow air bleed passage at an area which is larger than the flow area of said main air bleed passage;

an oxygen concentration detector arranged in the exhaust passage and detecting the oxygen concentration of the exhaust gas in the exhaust passage for producing a detecting signal, and;

an electronic control unit operated in response to the detecting signal of said oxygen concentration detector and producing a control signal for operating said electromagnetic device to actuate said first valve and said second valve so that an air-fuel ratio of the mixture fed into the cylinder becomes equal to a predetermined air-fuel ratio,

wherein said first valve is a reed valve, and said second valve is a reed valve, said electromagnetic device comprising an axially movable rod which is actuated in response to the control signal of said electronic control unit and is engageable with said first reed valve and said second reed valve, and

wherein said valve means comprises a valve chamber connected to the atmosphere an having an inner wall on which said first reed valve and said second reed valve are mounted, said slow air bleed passage having an air inlet formed on the inner wall of said valve chamber and closed by said first reed valve, said main air bleed passage having

an air inlet formed on the inner wall of said valve chamber and closed by said second reed valve.

4,432,325
ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

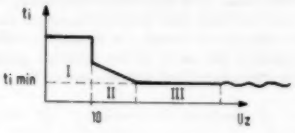
Gerd Auracher, Grossbottwar; Albrecht Clement, Kornwestheim; Rolf Däumer, Weil d. Stadt; Helmut Schwarz; Thomas Theml, both of Vaihingen; Wilfried Venzke, Möglingen; Gustav Virgilio, Winnenden; Bernhard Weichel, Stuttgart, and Thomas Wilfert, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,765

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042245

Int. Cl.³ F02N *17/00*; F02P *5/04*

U.S. Cl. 123—491 **14 Claims**



1. An electronic control system for an internal combustion engine having fuel metering means for metering fuel to the engine in accordance with a fuel metering signal and ignition means for initiating combustion of fuel within the engine in accordance with an ignition signal, which comprises:

fuel metering control means for generating said fuel metering signal during an engine starting period such that the metered fuel quantity is maintained at a first constant value during a first phase of an engine starting period, the metered fuel quantity is changed from a second value to a threshold in accordance with at least one of the engine variables of temperature, rpm, and total number of revolutions during a second phase of the engine starting period, and the metered fuel quantity is maintained at said threshold value during a third phase of said engine starting period, the duration of said first phase depending upon the occurrence of one of selected values of the engine variables of rpm and total number of revolutions; and

ignition control means for generating said ignition signal such that the time of ignition is adjusted toward "early" from a reference ignition time in accordance with at least one of the engine variables of rpm and temperature.

4,432,326
DEVICE FOR CONTROLLING THE ANGLE OF ADVANCE IN A FUEL-INJECTION PUMP OF AN INTERNAL-COMBUSTION ENGINE

Manuel Roca-Nierga, Barcelona, Spain, assignor to SPICA S.p.A., Leghorn, Italy

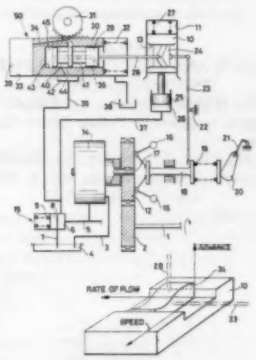
Filed Apr. 14, 1982, Ser. No. 368,117

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115718

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 **11 Claims**

1. A control device for adjusting the instant of time of the start of the delivery in an injection pump for an internal combustion engine comprising means responsive to the rpm of a fuel pump for displacing a slider in a first direction, said slider slidably carrying a cam body thereon, means responsive to the rate of flow delivered by an injection pump for moving said cam body in a second direction perpendicular to said first direction relative to said slider, said cam body having a cam surface against which rests a feeler, said feeler being mounted for movement by said cam surface in a third direction perpendicular to said first and second directions, and control means



responsive to movement of said feeler for effecting the start of the delivery of said injection pump.

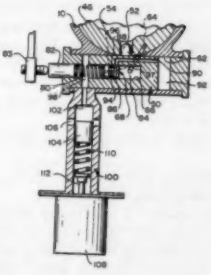
4,432,327
TIMING CONTROL FOR FUEL INJECTION PUMP

Daniel E. Salzgeber, Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Mar. 4, 1982, Ser. No. 354,649

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **15 Claims**



1. For use in association with an internal combination engine having a plurality of engine cylinders, a fuel injection pump having a housing, a charge pump to deliver measured charges of liquid fuel in successive pumping strokes to the cylinders of the associated engine, timing means to vary the timing of the pumping relative to the operation of the associated engine, and actuating means for actuating the timing means for advancing and retarding the timing of the pumping strokes responsive to the operating parameters of the associated engine, said actuating means comprising a spring biased piston for actuating the timing means and having fluid chambers at opposite ends thereof, a source of fluid under pressure correlated with engine speed in communication with one of said chambers and acting against the bias of the spring to advance the timing of the pumping strokes with increased engine speed, a fluid under pressure in the second of said chambers, a drainage passage for releasing fluid from the second chamber to reduce the pressure therein, and failsafe valve means for selectively controlling the release of fluid through said passage, said failsafe valve means comprising a bleed valve member and bleed valve control means operable by at least one set of continuous measurements of an operating parameter of the associated engine for operat-

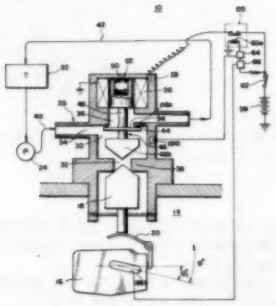
ing the bleed valve member to continually bleed fluid from said second chamber in accordance with said continuous measurements.

4,432,328

VAPOR LOCK AND PERCOLATION PHENOMENA INHIBITING SYSTEM

Seiichi Shimizu, Higashimurayama, and Kouichi Iguchi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 4, 1980, Ser. No. 203,850
Claims priority, application Japan, Nov. 6, 1979, 54-142753
Int. Cl.³ F02M *37/20*
U.S. Cl. 123—516 **8 Claims**



1. A vapor lock and percolation phenomenon inhibiting system of an engine fuel supply system having a fuel tank and a carburetor with a float chamber, comprising:

a housing having a chamber and first, second and third openings communicating with said chamber, said first opening being connected with said float chamber, said second opening being connected with said fule tank through a fuel supply passage;

a fuel return passage leading from said third opening to said fuel tank;

an orifice connecting said chamber with said fuel return passage, bypassing said third opening;

a valve element capable of selectively closing and opening said third opening, said valve element being constructed to open said first opening when closing said third opening and to close said first opening when opening said third opening, said valve element including separate first and second valve element sections, said first valve element section functioning to open and close said third opening, and said second valve element section functioning to open and close said first opening;

a temperature sensor for sensing the temperature of fuel in said chamber; and

control means for actuating said valve element to open said third opening when the temperature sensor senses that the temperature of the fuel in the chamber is higher than a predetermined value.

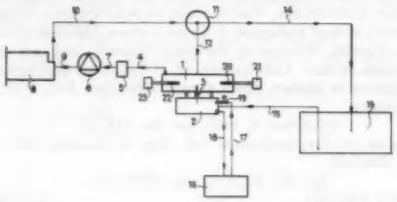
4,432,329

APPARATUS FOR HEATING FUEL INJECTED INTO A DIESEL ENGINE

Jean E. A. Rédélé, Paris, France, assignor to Scoma Energie, Paris, France

Filed Jul. 1, 1982, Ser. No. 394,150
Claims priority, application France, Jul. 8, 1981, 81 13417
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **8 Claims**

1. An apparatus for heating fuel injected into Diesel engine fuel tank, said apparatus comprising a heat exchanger, heat-carrying fluid supply means, pipe means connecting the heat-carrying fluid supply means to the heat exchanger, means for connecting the heat exchanger to the fuel tank, a vessel for containing a reserve supply of hot fuel and containing at least one auxiliary source of heat, an injection pump having an inlet and an outlet, a thermostat valve comprising three ways, first pipe means connecting a first of said ways to the outlet of the



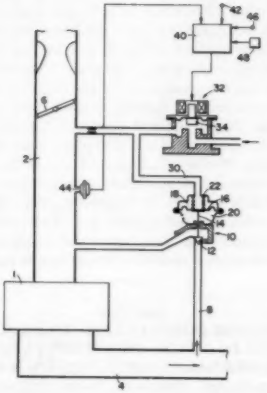
injection pump, second pipe means connecting a second of said ways to the vessel and third pipe means connecting a third of said ways to the fuel tank, pipe means connecting the inlet of the injection pump to the vessel, the thermostat valve being arranged to connect the outlet of the injection pump to the vessel below a previously-fixed temperature of the fuel in the vessel.

4,432,330

EXHAUST GAS RECIRCULATION SYSTEM HAVING ELECTRICAL CONTROL MEANS

Kazutoshi Otsuka, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jan. 25, 1982, Ser. No. 342,344
Claims priority, application Japan, Jan. 27, 1981, 56-10528
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **7 Claims**



1. An exhaust gas recirculation system for an internal combustion engine having intake and exhaust systems, said recirculation system comprising gas recirculation passage means for directing a part of the engine exhaust gas from the exhaust system to the intake system, recirculation rate control valve means provided in said gas recirculation passage means and adapted to be actuated by an engine intake suction pressure, pressure adjusting means for adjusting the intake suction pressure applied to said control valve means, first sensing means for sensing engine operating conditions and producing engine operating condition signals, control means for producing a control signal in response to the signals from said first sensing means, second sensing means for sensing engine intake suction pressure and producing suction pressure signals which are

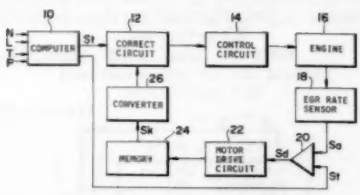
applied to said control means, third sensing means for sensing special engine conditions and producing special condition signals which are applied to said control means, first memory means associated with said control means and containing first compensating factors corresponding to various values of the suction pressure signals, second memory means associated with said control means and containing second compensating factors corresponding to various values of the special condition signals, said control means taking an appropriate one of said first compensating factors in accordance with the suction pressure signal and an appropriate one of said second compensating factors in accordance with the special condition signal to compensate said control signal, said control signal being applied to said pressure adjusting means to operate the same.

4,432,331

ENGINE CONTROL SYSTEM

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 21, 1982, Ser. No. 390,687
Claims priority, application Japan, Jun. 30, 1981, 56-101841
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **17 Claims**



8. An engine control system for use with an intrnal combustion engine including an EGR device for recirculating engine exhaust gases to combustion chambers of said engine, said engine control system being responsive to engine operating parameters for determining a target value of EGR rate and controlling said EGR device to achieve EGR rate of said target value, said engine control system including a sensor associated with said EGR device for sensing an actual value of EGR rate, a comparator for detecting a difference between said actual and target EGR rate values, a memory for storing a correction factor corresponding to said detected difference, and means for connecting said target EGR rate value for said stored correction factor, said memory comprising:

(a) a potentiometer having a resistor and a wiper movable in sliding contact with said resistor;

(b) a reversible motor drivingly connected to said potentiometer wiper for moving said wiper on said resistor; and

(c) a motor drive circuit for rotating said reversible motor in one or reverse direction in accordance with said detected difference so as to permit said wiper to tap off a resistance corresponding to said detected difference.

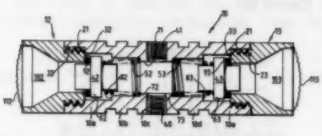
4,432,332

FUEL ECONOMIZER DEVICES

John McFarlane, Johnstone, and Andrew Guy, Linwood, both of England, assignors to Sonell Products Limited, Thetford, England

Filed Jul. 17, 1981, Ser. No. 284,228
Int. Cl.³ F02M *23/08*
U.S. Cl. 123—587 **1 Claim**

1. A fuel economiser device for use in combustion engines comprising a main body, a circular bore in said body extending axially thereof, an outlet in said body for communication with an inlet to said engine for a combustible mixture said outlet being in the form of a radial aperture in said body, each end of said bore defining a respective one of two inlets in said body, a pressure operated valve associated with each inlet in the body, each valve having an adjustable valve seat against which a valve member is urged by means of a spring whereby, on occurrence of a predetermined vacuum level in said engine inlet, air may pass from the said inlets in the body to said outlet



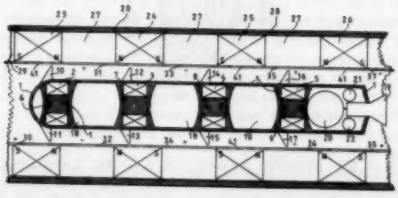
in the body thus to weaken the combustible mixture being supplied to the engine, wherein the valve members of the valves are urged against their respective seats by means of a single counter-balance spring.

4,432,333

ELECTROMAGNETIC PROJECTILE ACCELERATOR

Waldemar H. Kurherr, Heerdter Landstr. 201, D-4000 Duesseldorf 11, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 833,131
Int. Cl.³ F41F *1/02*
U.S. Cl. 124—3 **8 Claims**



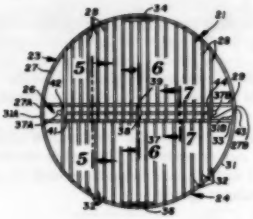
1. Electromagnetic projectile accelerator comprising: means for rigidly mounting stationary coreless electromagnetic coils spaced apart along a row, the spaces therebetween being sealed with tightly fitted electrically and magnetically nonconductive rigid spacer-rings, said coils and rings together forming an acceleration tube having exterior and interior wall surfaces, the exterior wall surface being surrounded with a ferromagnetic material, the interior wall surface consists of an electrically and magnetically nonconductive material on which wall surface a plurality of electrically conductive plates are mounted so as to be spaced apart along the interior of said tube, said plates being electrically connected and electrically isolated from each other and electrically poled opposite to each other, said stationary coils being electrically connected and energized such that the stationary coils face each other with opposing magnetic poles; free floating projectile means disposed within said acceleration tube comprising a magnetically and preferably electrically nonconductive projectile body, a plurality of electromagnetic coil means rigidly mounted in a spaced apart manner within said projectile, said electromagnetic coils including cores therein whereby said electromagnetic coils are electrically connected to conductors mounted on upper and lower exterior surfaces of the projectile body whereby electric current is conducted from at least one of said electrically positive poled plates through the respective conductor thus energizing the electrically connected electromagnetic coil within the projectile thereby leaving via arcing from the other conductor into at least one of the electrically negative poled plates, whereby consecutive alternating switching due to the forward motion of the projectile through the electric field of the alternatingly electrically poled plates a continuous acceleration of the projectile within the preferably evacuated acceleration tube is performed.

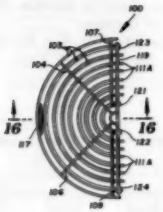
4,432,334

FOLDABLE GRID FOR COOKER

Jon R. Holt, 18212-24th Ave. North, Plymouth, Minn. 55447

Filed Jun. 7, 1982, Ser. No. 385,537
Int. Cl.³ F24C *15/08*; A47J *0/00*
U.S. Cl. 126—9 B **15 Claims**





1. A grid assembly for use with a cooker comprising: first grid means having first rods for supporting food, second grid means having second rods for supporting food, and hinge means pivotally connecting the first grid means to the second grid means, said first and second grid means being movable relative to each other, between an aligned open position and a folded position, wherein said first and second grid means are in spaced side-by-side positions, said hinge means including a hinge rod permanently connected to a plurality of said first and second rods to pivotally mount said plurality of first and second rods on said hinge rod, a first transverse member secured to said first rods adjacent on side of the hinge rod, said second rods having end sections engageable with the first transverse member when the first and second grid means are in the aligned position, a second transverse member secured to said second rods adjacent said hinge rod and on the side opposite said one side of the hinge rod, said first transverse member being engageable with the second transverse member when the first and second grid means are in the folded position to locate the first and second grid means in said spaced side-by-side positions.

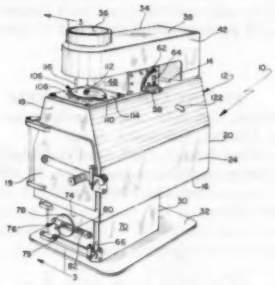
4,432,335

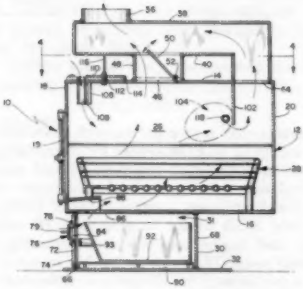
STOVE CONSTRUCTION FOR ACHIEVING COMPLETE FUEL COMBUSTION

Peter Kilham, Mill Rd., Foster, R.I. 02825

Filed Dec. 3, 1981, Ser. No. 327,028
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—60 **2 Claims**

1. A heating stove for the efficient burning of a suitable fuel such as coal or wood comprising, a stove housing defining a combustion chamber wherein combustion gases from said burning pass upwardly through a primary flue opening positioned through said housing at an upper rear portion of said chamber, a baffle disposed in said chamber at a position forward and below said primary flue opening so as to downwardly deflect said combustion gases from upper parts of said chamber into an exit zone adjacent said baffle and located within said chamber, primary draft means for introducing primary combustion air into said chamber and means for introducing secondary combustion air directly into said exit zone so as to more completely burn combustible material in said combustion gases to as to in turn reduce creosote therein and to raise the combustion efficiency of said stove, said housing including top, bottom, front, rear and connecting walls which define said combustion chamber, said primary flue opening disposed in said top wall at a position adjacent said rear wall,





said primary draft means including a plurality of separate draft tubes downwardly extending from the forward portion of said top wall into said combustion chamber for directing primary combustion air downwardly towards the housing bottom wall and the base of the burning fuel supported thereby, including a swivable plate mounted on said top wall and movable to progressively cover the tops of one or more of said tubes so as to regulate the amount of primary combustion air passing into said combustion chamber.

4,432,336

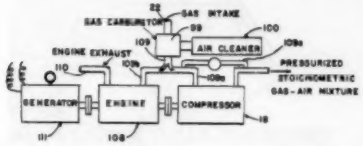
ENERGY CONVERSION SYSTEM

Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404

Division of Ser. No. 105,277, Dec. 19, 1979, Pat. No. 4,353,348, which is a division of Ser. No. 813,667, Jul. 7, 1977, Pat. No. 4,197,831, which in turn is a continuation of Ser. No. 620,327, Oct. 7, 1975, now abandoned, which in turn is a continuation-in-part of Ser. No. 462,094, Apr. 18, 1974, Pat. No. 4,025,291, which in turn is a division of Ser. No. 192,262, Oct. 26, 1971, Pat. No. 3,844,270.
This application Nov. 23, 1981, Ser. No. 324,266
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—91 R **2 Claims**

1. A system for use in heating solid, liquid or gaseous materi-

als, comprising a burner element having a closed combustion chamber with inlet and discharge ports, a carburetor supplying a substantially stoichiometric mixture of gaseous fuel and air, means for pressurizing said mixture including a pressurizer, a gas burning prime mover for driving the pressurizer, a manifold for delivering said stoichiometric mixture from said carbu-



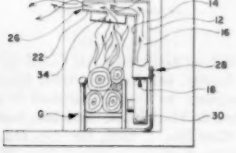
retor, the manifold being branched to separately deliver portions of said mixture to said prime mover and to said pressurizer, a supply line for delivering the pressurized mixture from the pressurizer to the inlet port of the burner element, and an adjustable valve in the supply line.

4,432,337

METHOD AND APPARATUS FOR EFFICIENTLY CAPTURING AND DISTRIBUTING HEAT PRODUCED BY GAS LOGS

Willis H. Gregory, Rte. 2, Angier, N.C. 27501

Filed May 8, 1981, Ser. No. 261,880
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **2 Claims**



1. An apparatus for use in conjunction with a fireplace having gas logs for effectively receiving heat generated by said gas logs and disbursing the same outwardly from said fireplace in a forced air fashion, comprising:

(a) a duct structure adapted to be situated within a fireplace, said duct structure having:

(i) an inlet end and exhaust end;

(ii) an intermediate duct portion disposed between said inlet and exhaust ends and normally assuming a position over said gas logs when said duct structure is situated in said fireplace;

(iii) an opening formed in and across a selected area of said intermediate duct portion over the area normally occupied by said gas logs; and

(iv) an inclined plate extending generally over said opening at an incline in the general direction of air passing within said duct structure; and

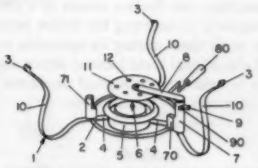
(b) fan means operatively associated with said duct structure for generating and directing a system of air into said inlet end and causing the system of air to move through said duct structure and to rush over said plate and the opening underlying said plate whereby to draw heated air from said gas logs into said duct structure opening to combine with said system of air generated by said fan means to form a warm system of air that is exhausted out said exhaust end of said duct structure into a surrounding area about said fireplace.

4,432,338

STACKABLE MULTI-PURPOSE HEATER WITH CONTROLLABLE HEAT ACTION

Rudolf C. Buchmann, Battertweg 1, Baden-Baden, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,848
Claims priority, application Switzerland, May 26, 1981, 3436/81
Int. Cl.³ F24C 5/04; A47G 23/02
U.S. Cl. 126—256 **14 Claims**



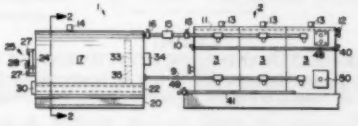
1. In a stackable, multi-purpose heater having at least one open flame heat source which is adapted to apply heat to the bottom surface of a food carrier such as a food plate; means for controlling the heat from the heat source, including a movable apertured plate; and a support frame for supporting the heat source and the apertured plate, said support frame being further adapted to support the food carrier, the improvement comprising wherein the support frame includes means for facilitating a releasable connection between the support frame and the food carrier; wherein for the regulation of the heat from the open flame acting onto the food carrier, the apertured plate is supported for movement to and from a position between the heat source and the food carrier by apertured plate support means on the support frame, the apertured plate further having a handle; and wherein the apertured plate support means provides the apertured plate with a fixed range of movement and tends to maintain the apertured plate in a desired position, the apertured plate being movable to a position spaced from the open flame heat source so that the heater, when the food carrier has been removed, can be stacked with like units without interference by the apertured plates and said apertured plate support means.

4,432,339

SOLID FUEL BURNING HEATING SYSTEM

Carlton A. Hebert, R.F.D. #1, Box 430 (Starks), Anson, Me. 04911

Continuation-in-part of Ser. No. 157,074, Jun. 6, 1980, abandoned. This application Jan. 24, 1983, Ser. No. 460,174
Int. Cl.³ F24B 9/00
U.S. Cl. 126—368 **20 Claims**



1. A solid fuel burning heating system, comprising furnace means including a firebox, water jacket means having a given water volume encasing said firebox and including an inner jacket wall forming a heat exchange surface for separating water in said water jacket means from the interior of said firebox means, separate hot water storage tank means having a volume which is substantially larger than said given water volume in said water jacket means, first pipe means (9) connecting said water jacket means (4) to said hot water storage tank means (3) at a first relatively low elevational level, second

pipe means (10) connecting said water jacket means to said hot water storage tank means at a second elevational level sufficiently higher than said first low elevational level yet below the water level in said hot water storage tank means for assuring a gravity water circulation flow between said water jacket means and said hot water storage tank means, said water jacket means, said hot water storage tank means and said first and second pipe means forming an interconnected container system having a common water level (11), door means including a door opening operatively connected to said firebox means for charging fuel into said firebox means, flue discharge means operatively connecting said firebox means to a chimney, and vent means operatively connecting the entire interconnected container system at all times during its operation to the atmosphere at a third elevational level located above said common water level (11) in said interconnected container system to assure said gravity water circulation flow.

4,432,340

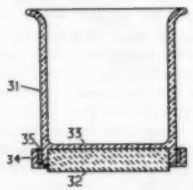
ENERGY SAVING HEATING VESSEL

Louis A. Conant; Wilbur M. Bolton, both of Rochester, and James E. Wilson, Livonia, all of N.Y., assignors to Intertec Associates Inc., Rochester, N.Y.

Continuation of Ser. No. 207,082, Nov. 14, 1980, abandoned. This application Oct. 5, 1982, Ser. No. 432,629

Int. Cl.³ A47J *27/00*

U.S. Cl. 126—390 **12 Claims**



1. An energy efficient heating vessel having thermally insulative sidewalls of a plastic material, and a thermally conductive bottom, said bottom including:

an inner film of a plastic material intergral with said sidewalls, said film being thin for minimal resistance to heat transfer but of sufficient substance as to be liquid impervious to separate liquid from said conductive bottom, and

an outer layer of thermally conductive graphitic material in thermal contact with and supporting said inner film, and adapted for thermal contact with a heating surface,

said vessel effective to transmit heat from said heating surface through said bottom to the contents of said vessel, and to retard the transfer of heat from said contents through said sidewalls, for enhanced efficiency of liquid heating.

4,432,341

SOLAR HEATER AND ROOF ATTACHMENT MEANS

Gary L. Howe, Mankato, and Samuel G. Koutavas, Faribault, both of Minn., assignors to Future Tech, Inc., Mankato, Minn.

Continuation-in-part of Ser. No. 375,366, May 6, 1982, abandoned. This application May 5, 1983, Ser. No. 489,867

Int. Cl.³ F24J *3/02*

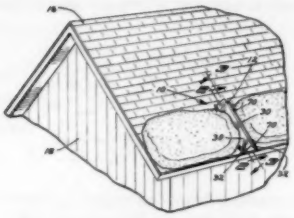
U.S. Cl. 126—417 **13 Claims**

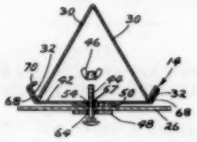
1. A solar heater and deicer for use on a slanted roof includes:

A. a solar collector including two elongated solar panels of heat conductive material fixedly connected to each other along first edges of each to lie in angular relation to each other;

B. said panels each being provided with an upturned gutter portion along a second edge thereof parallel to and opposite the first edge;

C. each gutter portion lying in acute angular relation to its panel and extending in direction away from the other panel; and





D. roof attachment means to support the solar collector in slightly spaced, parallel relation to a slanted roof to have a first end of the collector in adjacent relation to a bottom edge of the roof and a second end of the collector higher up the roof.

4,432,342

INFLATABLE SOLAR COLLECTOR

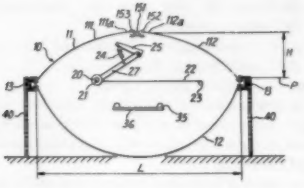
Jean Lucas, Antony, and Lancine Sylla, Korotoumou, both of France, assignors to Centre National D'Etudes et D'Experimentation de Machinisme Agricole, Antony, France

Filed Dec. 1, 1980, Ser. No. 212,191

Claims priority, application France, Nov. 30, 1979, 79 29576

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—418 **7 Claims**



1. In a solar collector of the mirror type which is shaped by superatmospheric gaseous pressure on its surface, comprising a rigid frame defining at least two longitudinal edges (13) with at least one sheet (12) secured by its edges on said longitudinal edges of said frame, the surface of said sheet (12) being reflective, a transparent element (11) which is at least partly spaced from said at least one sheet and is impervious to the superatmospheric fluid pressure that shapes said at least one sheet, and means closing the space between the transparent element and said at least one sheet and which enclose with said at least one sheet and transparent element the interior of the collector; the improvement in which

the frame is stationary, and a housing (40) which is rigid against the pressure of the wind and which comprises a

pair of upright stationary walls that are parallel to said longitudinal edges and that extend from the ground up to the edges of said at least one sheet (12).

4,432,343

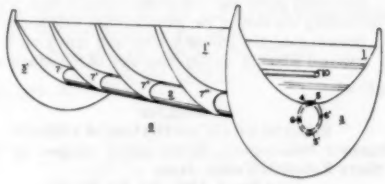
SOLAR ENERGY COLLECTOR SYSTEM

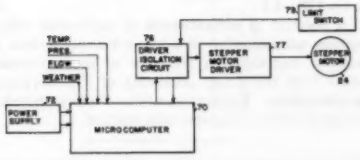
H. Norman Riise; George G. Goranson, both of La Canada, and Henry P. Karwan, Fountain Valley, all of Calif., assignors to Viking Solar Systems, Incorporated, Glendale, Calif.

Continuation of Ser. No. 126,243, Mar. 3, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 369,673

Int. Cl.³ F24J 3/02

U.S. Cl. 126—424 **18 Claims**





1. A solar energy collector system, comprising;

(a) a transmissive-reflective trough-like quasi-parabolic integrally rigid concentrator (8) having a linear focus,

(b) an elongated tubular support (2) having a sector (3) centrally supporting said concentrator, said tubular support attached to but optically removed from said concentrator,

(c) a geometrically fixed at one end highly-elongated stationary linear energy-receiver essentially wholly disposed at said linear focus, and having a hydraulic use circuit (61,62),

(d) elongated .means-to-rotate (29,25) said concentrator about said energy-receiver, disposed at right-angles to said concentrator,

(e) a prime mover (24,24' or 52),

(f) means-to-couple (30,32) said prime mover to said sector (3) for the rotation of said concentrator, and

(g) microcomputer means (70) for control of said prime mover, including means, structured and programmed for fixed and variable parameters of spherical geometry relative to the rotation of the earth, for calculating the position of the sun and accounting for atmospheric refraction, and structural deflections, according to the program equation $ROT = -TAN^{-1}(SJ/SI)$ to exclusively control said prime mover and to maintain an image of the sun essentially wholly upon said energy-receiver by essentially continuous recomputation.

4,432,344

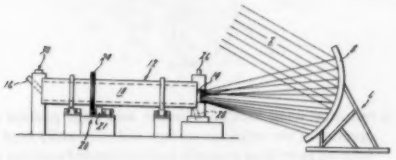
METHOD AND APPARATUS FOR SOLAR DESTRUCTION OF TOXIC AND HAZARDOUS MATERIALS

James E. Bennington, Ann Arbor, Mich.; Gerald E. Bennington, Vienna, Va.; Frederick E. Bernardin, Jr.; Donald J. Patterson, both of Ann Arbor, Mich., and Walter J. Weber, Jr., Ypsilanti, Mich., assignors to Focus Environmental Systems, Ann Arbor, Mich.

Filed Jul. 15, 1981, Ser. No. 283,642

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **11 Claims**



1. In a system including a working chamber, a method for destruction of toxic and hazardous materials, comprising:

feeding said materials into a working chamber;

collecting and filtering solar energy and focusing said filtered solar energy into said working chamber to directly act upon said materials in said working chamber; and

exhausting the byproducts of said materials out of said working chamber while minimizing any need for any large volumes of gaseous throughput through said working chamber.

4. An apparatus for the destruction of toxic and hazardous materials, said materials having specific chemical bonding energies, comprising:

a reactor comprising a reaction chamber, including means for withdrawing material from said chamber and having a reaction zone within said chamber;

a transparent window set in one surface of said reactor, said window being transparent to solar radiation at the wanelengths corresponding to the bonding energies of said materials;

means for collecting solar radiation, directing solar radiation into said reaction chamber through said transparent window, concentrating said solar radiation to within said reaction zone, and focusing solar energy in said zone; and

means for feeding toxic or hazardous materials primarily by gravity into the interior of said reactor at said reactor zone;

wherein the high intensity specific wavelength energy present in said concentrated sunlight breaks chemical bonds in said toxic or hazardous materials and accelerates decomposition of the chemical compounds of said toxic or hazardous materials, degrading said compounds in direct proportion to the original concentration of the compounds.

4,432,345

RECEIVER FOR SOLAR ENERGY COLLECTOR HAVING IMPROVED APERTURE ASPECT

William R. McIntire, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

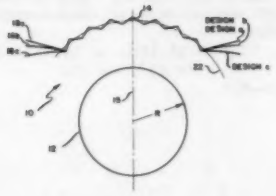
Filed Mar. 13, 1981, Ser. No. 243,308

Int. Cl.³ F24J 3/02

U.S. Cl. 126—439 **10 Claims**

1. In a solar energy collector having a primary concentrator which includes a rim portion and a center portion, said primary concentrator directing solar energy toward a solar energy receiver which comprises an absorber means having an apparent aperture when viewed from the primary concentrator, said solar energy receiver further comprising:

a secondary concentrator located adjacent said absorber means for reflecting solar energy directed from the primary concentrator onto said absorber means, said secondary concentrator including a reflector surface having a predetermined contour and at least one edge portion; and



a reflector wing located adjacent said edge portion of the contour of the reflector surface and outwardly bent therefrom so as to lie at an angle to the extended contour of said reflector surface of said second concentrator, to increase the apparent aperture of said absorber means when viewed from said rim portion of said primary concentrator.

4,432,346

SOLAR COLLECTOR

Björn V. Westerstrandh, Rotyxvägen 7, S-752 48 Uppsala, and Arne V. Karlsson, Näckrosgatan 7C, S-754 37 Uppsala, both of Sweden

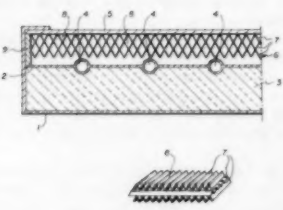
PCT No. PCT/SE80/00252, § 371 Date Jun. 17, 1981, § 102(e) Date Jun. 3, 1981, PCT Pub. No. WO81/01188, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 16, 1980, Ser. No. 268,986

Claims priority, application Sweden, Oct. 17, 1979, 7908582

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—445 **9 Claims**



1. In a solar collector comprising a solar radiation absorbing surface means for transferring heat from the absorbing surface to at least one heat carrying fluid, a transparent cover spaced apart from the absorbing surface, and a convection and heat radiation suppressing structure positioned between the absorbing surface and the transparent cover, the improvement comprising, said convection and heat radiation suppressing structure being substantially self-supporting and comprising at least two thin, corrugated transparent foils numbering in a range of from 2 to about 20 foils placed adjacent to and on top of each other, such that adjacent foils define between themselves a system of long narrow ducts extending parallel to the absorbing surface, with the corrugations of adjacent foils extending at substantially right angles to each other; said means for transferring heat comprising at least one tube in heat exchange contact with the absorbing surface, said at least one heat carrying fluid comprising a liquid passing through said at least one tube, and/or a gas passing through the ducts of said foil structure.

4,432,347

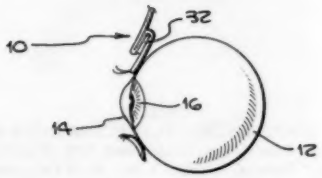
COSMETIC TAPE AND METHOD

Harold D. Clavin, 2001 Santa Monica Blvd., Suite 890-West, Santa Monica, Calif. 90404

Filed Nov. 12, 1982, Ser. No. 440,846

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—1 R **6 Claims**



1. A method for non-surgically taking a tuck in loose skin in an eyelid comprising the steps of:

(a) attaching one side of an adhesive strip having adhesive on both sides along one side of the intended tuck area; and

(b) folding the skin of the intended tuck that is not yet adheased over the adhesive strip and attaching it to the exposed adhesive on the other side of the adhesive strip.

4,432,348

ENHANCER OF ANTI-TUMOR EFFECT

Shigekazu Nakatsugawa, Kyoto, Japan, assignor to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Sep. 9, 1981, Ser. No. 300,977

Claims priority, application Japan, Sep. 17, 1980, 55-128001

Int. Cl.³ A61K *31/505*

U.S. Cl. 128—1.1 **12 Claims**

1. A method of enhancement of anti-tumor effect which comprises administering to a tumor-bearing animal under an anti-tumor treatment an enhancer of the anti-tumor effect selected from the group consisting of 3'-deoxyguanosine-5'-monophosphate, 3'-deoxyadenosine-5'-monophosphate and pharmaceutically-acceptable salts thereof.

4,432,349

ARTICULATED TUBE STRUCTURE FOR USE IN AN ENDOSCOPE

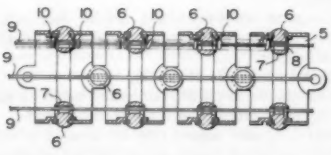
Susumu Oshiro, Iwatsuki, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation of Ser. No. 136,727, Apr. 2, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,602

Claims priority, application Japan, Apr. 3, 1979, 54-43183

Int. Cl.³ A61B *1/00*; F16L *11/00*

U.S. Cl. 128—4 **2 Claims**



1. An articulated tube structure for use in an endoscope connected between a head for inspection and a flexible tube which is connected with a manipulating box, said articulated tube structure comprising a number of elementary tubes connected in end-to-end relationship to form an articulated tube, connecting means for connecting the elementary tubes in such a manner that the articulated tube composed thereof is bend-

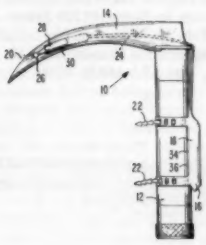
able, spring means for urging the articulated tube to bend in one direction, and manipulating means including pull wires extending through the elementary tubes along several sides of the articulated tube for bending the articulated tube in one direction by pulling one of the pull wires on one side of the tube and in another direction by pulling another pull wire on another side thereof, for allowing the articulated tube to bend by the force of said spring means, said spring means comprising a number of coil springs each inserted between adjacent elementary tubes, one coil spring being close to the head and another close to the manipulating box, the spring constant of the coil spring close to the head being larger than that of the coil spring close to the manipulating box.

4,432,350

MEANS FOR APPLYING TOPICAL ANESTHESIA FOR USE WITH A LARYNGOSCOPE

Alan J. Breslau, 11 Rust Hill Rd., and Bernard Broad, 2 Silverbell Rd., both of Levittown, Pa. 19056

Filed Apr. 17, 1981, Ser. No. 255,125
Int. Cl.³ A61B 1/24
U.S. Cl. 128—10 **16 Claims**



1. In laryngoscope having a blade and a handle, the improvement comprising means for applying topical anesthesia, said application means comprising:

(a) a reservoir means for containing a predetermined amount of topical anesthetic fluid therein, said reservoir means defining a fluid chamber therein to hold the topical anesthetic fluid;

(b) an attachment means for detachably securing said reservoir means directly to the handle of said laryngoscope;

(c) a supply conduit means being attached to said reservoir means at a particular point and extending outwardly therefrom, said supply conduit means having two ends, one of which is at the point of attachment with respect to the reservoir means, said supply conduit means being in fluid flow communication with respect to said fluid chamber and adapted to receive topical anesthetic fluid therein for movement therealong;

(d) a conduit tip means located at the end of said supply conduit means opposite from the point of attachment with respect to said reservoir means, said conduit tip means adapted to release topical anesthetic fluid received from said supply conduit means;

(e) a retainer means attached with respect to said blade of said laryngoscope and detachably securing said supply conduit means with respect thereto;

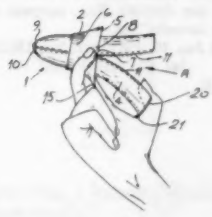
(f) a delivery means being engageable with respect to said reservoir means to compress said fluid chamber defined therein to cause the topical anesthetic fluid to be expelled from said fluid chamber through said supply conduit means for release through said conduit tip means.

4,432,351

VAGINAL SPECULUM

Marto J. Hoary, Eyrecourt, Ireland, assignor to Institute for Industrial Research and Standards, Dublin, Ireland

Filed Jun. 16, 1981, Ser. No. 274,317
Claims priority, application Ireland, Jun. 26, 1980, 1324/80
Int. Cl.³ A61B 1/32
U.S. Cl. 128—17 **8 Claims**



1. A vaginal speculum comprising:

an introitus engaging ring member having a longitudinally extending outer surface to project partly into the introitus, and

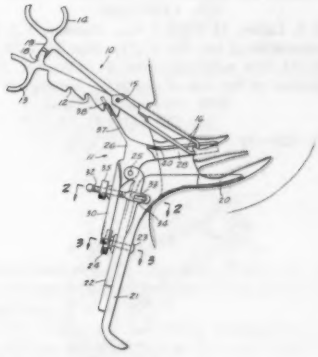
a pair of elongated vagina engaging members slideable longitudinally through the introitus engaging ring member to engage the interior of the vagina, at least one of the vagina engaging members being of arcuate shape in longitudinal cross-section over at least a portion of its length so that on sliding longitudinally through the ring member the vagina engaging members move apart relative to one another to engage the vagina.

4,432,352

CERVICAL TRACTION KIT

Richard D. Wineland, 500 E. Olive Ave., Burbank, Calif. 91501

Filed Mar. 8, 1982, Ser. No. 354,921
Int. Cl.³ A61B 1/32
U.S. Cl. 128—17 **9 Claims**



1. A speculum comprising:

first and second elongated blades extending lengthwise of one another each having a forward and a rear end and including means interconnecting the same for movement of the forward ends thereof toward and away from one another, said second blade being substantially shorter than said first blade and having a slot extending lengthwise thereof and opening through the forward end of said second blade;

the rear ends of said blades including handgrip means manipulatable to move said blades relative to one another; and

means on said second blade adapted to engage a tenaculum and support the same in an inclined position relative to and lengthwise of said second blade with the tenaculum jaws extending through said slot and generally into the space between the forward ends of said first and second blades.

4,432,353

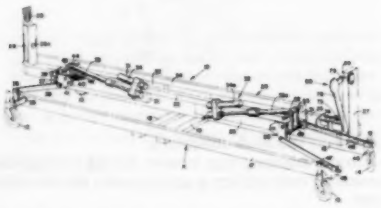
KINETIC TREATMENT PLATFORM

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Filed Jan. 19, 1981, Ser. No. 226,118

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—24 R **16 Claims**



1. A therapeutic bed for immobilized patients having an oscillating patient support platform mounted for controlled oscillation about longitudinally extending axes, comprising:

a releaseable locking means connecting a drive means with a patient support platform for controllably oscillating the platform about a longitudinal extending axis thereof;

said releasable locking means having releasing and engaging settings so that it can be placed in either setting at any position of oscillation of the platform to release or engage the drive means and the patient support platform when friction forces acting on the releasable locking means are relieved.

4,432,354

HYPERBARIC OXYGEN CHAMBER WITH FLUIDIC CONTROL

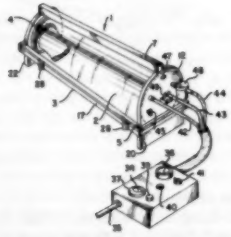
Robert A. Lasley, 11 Wardell Ave., Rumson, N.J. 01760

Continuation of Ser. No. 42,114, May 24, 1979, Pat. No. 4,296,743. This application Mar. 31, 1981, Ser. No. 249,482

The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.

Int. Cl.³ A61H *31/02*

U.S. Cl. 128—30 **3 Claims**



1. A low pressure hyperbaric device for treatment of a patient comprising a two part chamber, means for holding the two parts in assembled and sealed condition, the chamber having an entrance adapted to allow the introduction of a body part, means associated with the entrance to seal the body part to thereby provide an air tight chamber, a pressured source of gas and means for cyclically pressurizing the hyperbaric chamber with gas and exhausting the hyperbaric chamber said means including:

timing means connected in series with the pressurized source of gas for controlling on-off gas flow for the overall treatment time, valve means connected to the flow from the timing means, said valve means being moveable to the moveable position upon receiving the gas flow from the timing means, a flow control means connected on its inlet side to the valve means and to the hyperbaric chamber on its outlet side, said flow control means controlling flow into the hyperbaric chamber, an exhaust valve in fluid communication with the chamber, a second flow line extending from the valve means to the exhaust valve for the hyperbaric chamber, pressure control means having an inlet in communication with the pressure in the hyperbaric chamber and an outlet in communication with the valve means whereby when the prescribed pressure is reached within the hyperbaric chamber the pressure control means closes the valve means thereby releasing the exhaust valve so that the hyperbaric chamber pressure will be exhausted and whereby upon the return of the chamber to ambient pressure the valve means is returned to open position for a new cycle.

4,432,355

HYDROMECHANICAL MASSAGING DEVICE

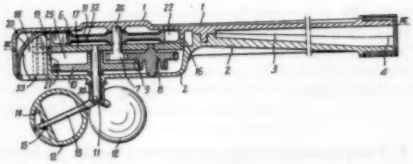
Rene Delluc, 2, Square du Berry, 91300 Massy, France

Filed Feb. 10, 1982, Ser. No. 347,677

Claims priority, application France, Mar. 10, 1981, 81 04739

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—56 **11 Claims**

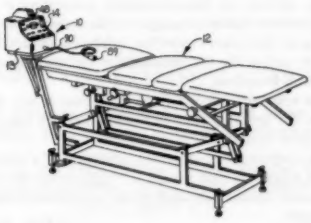


1. An hydromechanical massaging device for simultaneously applying mechanical and hydrotherapeutic massage to a patient's skin, comprising freely rotating balls carried on individual studs driven by a common shaft and at least one guided stream of water, and the features which consist of a shaft (**11**) driven by means of a paddle wheel (**6**) energized by water flowing at a pressure comprised between approximately 4 and 8 bars (58–116 psi) through a distributor (**5**) comprising a slide wall (**16**) which extends along a tangent to the circular path of the tips of the vanes (**22**) of said wheel (**6**) so as to form an extension of an annular cavity portion comprised between the periphery of the turbine wheel (**6**), a platen (**17**) forming the bottom of the turbine chamber and an upper wall (**1**), said platen (**17**) and said upper wall (**1**) respectively lying in close vicinity to the lower and upper edges of the vanes (**22**) of the turbine wheel, said side wall (**16**) gradually spreading out away from said annular portion so as to guide the water stream which has been driving the wheel (**6**) along a path which brings it directly to an exhaust channel (**18**) which is separated from, and located downstream from, the turbine wheel, and which exhausts a jet of water external to the device in a direction toward said balls and with sufficient kinetic energy to apply an hydrotherapeutic massage to the patient's skin; and a further feature consisting in transmitting the rotary motion of the turbine wheel (**6**) to the drive shaft (**11**) driving the rotary balls (**12**) by means of a reduction gear linking the shaft (**26**) of said wheel with said drive shaft (**11**), said reduction gear being isolated from the water circuit.

4,432,356
THERAPEUTIC TRACTION APPARATUS WITH MONITORING CIRCUIT MEANS

Ivan D. Sarrell, Rising Fawn, Ga.; David B. Bley, Chattanooga, and David W. Tibbets, Hixson, both of Tenn., assignors to Chattanooga Corporation, Chattanooga, Tenn.

Filed Sep. 5, 1980, Ser. No. 184,379
Int. Cl.³ A61H 1/02
U.S. Cl. 128—75 8 Claims



1. In a therapeutic traction applying apparatus adapted to intermittently apply a traction force to the body of a patient, and comprising a rotatably mounted drum, a length of cord having one end wound upon said drum and an opposite end adapted to be affixed to a traction appliance positioned on a patient, power means for rotating said drum in either direction to thereby selectively either wind-up or wind-down the cord on said drum, and control means for cyclically reversing the direction of rotation of said drum upon predetermined minimum and maximum forces being present in said cord, the improvement wherein said control means comprises

means including a control transducer having a resistance component for continuously monitoring the tension in said cord and for generating an electrical output signal (Eo) which is linearly proportional to such tension,

first force controlling means including a second transducer having a resistance component for generating an electrical output signal (Emax) representing a desired maximum tension in said cord,

second force controlling means including a third transducer having a resistance component for generating an electrical output signal (Emin) representing a desired minimum tension in said cord,

comparator circuit means for cyclically connecting said power means for rotation of said drum in the wind-up direction upon Eo equaling or being less than Emin, and connecting said power means for rotation of said drum in the wind-down direction upon Eo equaling or exceeding Emax, and

monitoring circuit means for detecting the failure of the resistance component of any one of said three transducers, and for generating an output signal upon such failure being detected which is operable to preclude operation of said power means in the wind-up direction.

4,432,357
CONDOM WITH RHEOPEXIC FILLED DEFORMABLE CHAMBER

Mark L. Pomeranz, 9760 Viceroy Dr. East, Jacksonville, Fla. 32217

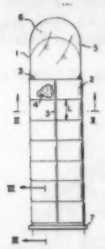
Filed Jun. 15, 1982, Ser. No. 388,107
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 17 Claims

16. A penis stiffening device comprising:

means defining an elongated generally tubular member of thin, flexible material;

means defining at least one deformable sealed chamber in said elongated tubular member;

rheopexic fluid filled in said at least one deformable sealed chamber such that when said deformable sealed chamber is deformed during use, shear stress is applied to said rheopexic fluid due to deformation of said sealed chamber to cause said rheopexic fluid to increase its consistency as a function of increasing shear stress supplied thereto,



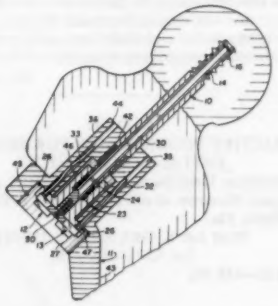
thereby providing a stiffening effect to said elongated tubular member; and

means for coupling said elongated tubular member to a penis.

4,432,358
COMPRESSION HIP SCREW APPARATUS

Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021

Filed Jan. 22, 1982, Ser. No. 341,863
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BB 8 Claims



1. Compression hip screw apparatus adapted for internal fixation and compression of a fractured portion of the proximal femur comprising

plate and barrel means for attaching said apparatus to said femur wherein said barrel means includes a smooth bore therethrough;

screw means for internally fixing the fractured portion of said femur, said screw means including a smooth cylindrical outer surface which is slidingly received within said smooth bore in said plate and barrel means;

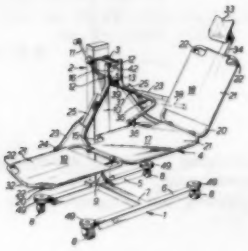
compressing means for compressing said fractured portion to said femur, said compressing means being adjustably attached to an end of said screw means; and,

locking means for simultaneously locking together said plate and barrel means, said compressing means, and said screw means.

4,432,359
EQUIPMENT FOR HANDLING INVALIDS AND THE DISABLED

David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England

Filed May 12, 1982, Ser. No. 377,358
Claims priority, application United Kingdom, May 16, 1981, 8115068
Int. Cl.³ A61F 13/00
U.S. Cl. 128—134 12 Claims

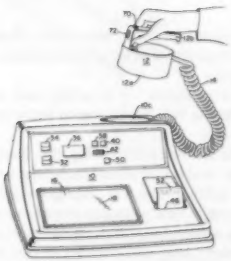


1. Equipment for handling invalids and disabled persons, comprising an articulated patient support structure with a central section and end sections separately adjustable relative to the central section for supporting the patient either lying down or seated so as to face, alternatively, in either direction longitudinally of the support structure, and restraining means with a first portion to extend laterally above said central section of the support structure with a patient seated thereon and a sideways extending retaining portion to extend alongside the body of the seated patient with said first portion of the restraining means extending in front of the body and above the legs of the patient, said restraining means being such that when in an operative position the restraining portion thereof is rotatably through an angle such that it can alternatively extend to one side or the other according to the direction in which the seated patient faces and said restraining means being so mounted as to be rotatable upwardly as a whole from said operative position to a raised inoperative position at one side of the support structure.

4,432,360
INTERACTIVE PROGRAMMER FOR BIOMEDICAL IMPLANTABLE DEVICES

Van E. Mumford; Louis Sasmor, both of Miami, and Edward A. Schroeppel, Miramar, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Jul. 6, 1981, Ser. No. 281,011
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 16 Claims



1. An interactive programmer console for programming implantable biomedical devices by enabling the operator to select among a number of parameter options including parameters and parameter values and then executing the reprogramming of the implant in accordance with the selected parameter options, comprising

a display screen,

a transparent switch matrix sheet covering said screen and having a plurality of transparent touch sensitive switch locations of undefined functionality distributed over the surface of the screen,

means for displaying on said screen a selectable set of parameter options by simultaneously generating a plurality of parameter option messages on the screen with juxtaposed targets over corresponding arbitrary switch locations so as to define the functionality of the corresponding set of switch locations,

means responsive to operator actuation of any switch location for ignoring such actuation unless a target is present at such location,

means responsive to operator actuation of a switch location at a target on said screen for registering the selected parameter option indicated by the juxtaposed message on the screen,

memory means for addressably storing and retrieving parameter data, and

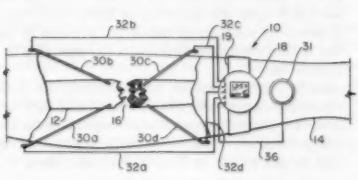
means responsive to an operator command for encoding and transmitting parameter data from said memory means corresponding to at least one parameter option selected by actuation of the temporarily corresponding switch, in a form capable of being received and decoded by said implant for executing the reprogramming of said implant in accordance with the selected parameter option,

whereby individual switch locations in said switch matrix can be redefined under control of the screen to designate different functions to accommodate different sets of programmable options.

4,432,361
PORTABLE CONTINUOUSLY SELF-MONITORING BONE HEALING DEVICE AND METHOD

James M. Christensen, San Diego, and Allan H. Mizoguchi, Del Mar, both of Calif., assignors to Sutter Biomedical Inc., San Diego, Calif.

Filed Jan. 18, 1982, Ser. No. 340,520
Int. Cl.³ A61N 1/20
U.S. Cl. 128—419 F 5 Claims



1. A completely portable, continuously self-monitoring device for expediting the healing of bone or soft tissue fractures or defects in a patient, said device comprising: an electrical power supply, a plurality of first electrodes, a second electrode and circuit means cooperating with said power supply for applying a regulated flow of current between each of said first electrodes and said second electrode through the fracture or defect site in the patient by the appropriate placement of said electrodes relative to said site; and monitoring means cooperating with said power supply, all of said electrodes and said circuit means during operation of the device for continuously detecting and visually indicating whether or not said power supply is in operating order and whether or not a minimum predetermined amount of current is flowing between each of said first electrodes and said second electrode, said monitoring

means including means for visually indicating whether or not said power supply is in operating order and whether or not current is flowing between each of said first electrodes and said second electrode, said visual indicating means including fixed indicia representing that the power supply is on and representing the circuit paths between corresponding first electrodes and the second electrode so long as the power supply is in operating order and, if said power supply is in operating order, changeable indicia adjacent the fixed indicia for indicating whether or not at least said predetermined amount of current is flowing between each of said first electrodes and said second electrode.

4,432,362

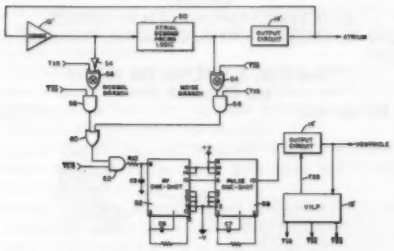
ATRIAL-BASED, ATRIAL-VENTRICULAR SEQUENTIAL CARDIAC PACER

Michael E. Leckrone, Indianapolis, Ind., and James P. Martucci, Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Division of Ser. No. 153,422, May 27, 1980, Pat. No. 4,386,610. This application Mar. 8, 1982, Ser. No. 355,367

Int. Cl.³ A61N 1/36

U.S. Cl. 128—419 PG **13 Claims**



1. A fully implantable AV sequential pacer including an implantable enclosure with electronic circuitry, wherein the improvement further comprises

electrical means defining an atrial channel and a ventricular channel,

means for repeatedly timing a fixed rate interval and for issuing an output pulse at a predetermined point therein,

means for resetting said timing means to restart the timing of said interval in response to a sensed natural electrical signal on the atrial channel,

means for stimulating the atria in accordance with said timing means output,

means responsive to a sensed natural electrical signal on the atrial channel for stimulating the ventricles following a predetermined AV delay in the absence of ventricular activity for a predetermined inhibit period.

4,432,363

APPARATUS FOR TRANSMITTING ENERGY TO A DEVICE IMPLANTED IN A LIVING BODY

Makoto Kakegawa, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Ootawara, Japan

Filed Jan. 5, 1981, Ser. No. 222,536

Claims priority, application Japan, Jan. 31, 1980, 55-9307

Int. Cl.³ A61N 1/36

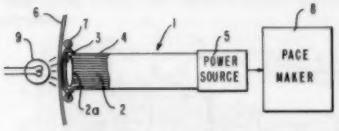
U.S. Cl. 128—419 PS **1 Claim**

1. Apparatus for supplying energy from a source outside a living body to a device having an energy supply terminal implanted in the body comprising:

means having an input adjacent the inside surface of the skin of the living body and including a bundle of optical fibers for transmitting light energy from said input to an output, said input also including a condensing lens for transmitting said light energy to said bundle of optical fibers,

a protective membrane covering said bundle of optical fibers and said condensing lens;

an annular projection formed in said protective membrane and surrounding said condensing lens for facilitating the attachment of the apparatus to the inside surface of the skin by sewing;



means for receiving said light energy from said output, for converting said light energy to electrical energy, and for applying said electrical energy directly to the energy supply terminal of said implanted device; and

energy source means for applying light energy to the outside surface of the skin of the living body opposite said input of the energy-transmitting means, said applied light energy penetrating the skin without rupturing the skin and entering said input.

4,432,364

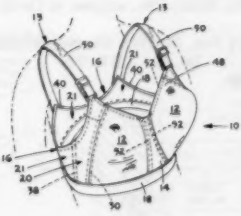
BRASSIERE

Jeanne M. Martini, Brooklyn, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.

Filed May 13, 1983, Ser. No. 494,341

Int. Cl.³ A41C 3/00

U.S. Cl. 128—484 **10 Claims**



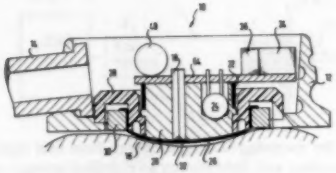
1. A brassiere construction comprising a pair of individual breast-receiving cups, each terminating in an apex at the top, means joining together said breast cups, a pair of panel means connected respectively to outer marginal edges of the breast cups for securing the brassiere in encircling relation to a wearer, each of said panel means including a first section secured to an adjacent breast cup and a second section extending around the side and to the back of a wearer, a pair of shoulder strap assemblies directly connected respectively to said pair of panel means, each shoulder strap assembly having a first portion coupled to said panel means first section adjacent a breast cup and a second portion attached to said panel means second section.

4,432,365

PHYSIOLOGICAL SENSING UNIT

Helmut Leist, Freiburg im Breisgau, Fed. Rep. of Germany, assignor to 501 Hellige GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 257,804
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018863
Int. Cl.³ A61B 5/00
U.S. Cl. 128—635 12 Claims



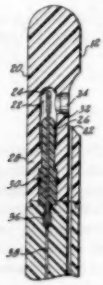
1. A physiological, electrically heated thermostatically controlled sensing unit, comprising:
a housing;
a sensing element supported within the housing for application to the skin of a living being;
an electric heater element located within the housing;
first temperature-responsive switch means located in the housing and adapted for coupling to a control circuit remote from the sensing unit for maintaining the sensing unit at a preselected temperature level in conjunction with said heater element;
a second switch for interrupting energization of the electric heater element;
temperature-responsive control circuit means contained in the housing for operating the second switch to interrupt energization of the electric heater element if the temperature of the sensing unit exceeds the pre-selected temperature level to reach a predetermined threshold value;
power supply means for the control circuit means;
power supply means for the electric heater element; and
means for coupling the sensing element to monitoring equipment.

4,432,366

REFERENCE ELECTRODE CATHETER

Gary S. Margules, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 27, 1981, Ser. No. 325,402
Int. Cl.³ A61B 5/00
U.S. Cl. 128—635 18 Claims



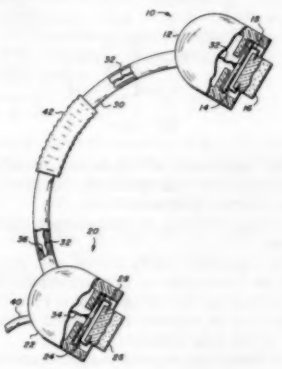
1. A reference electrode catheter for use in potentiometric electroanalysis in body fluids comprising:
an elongated cylindrical tubing having proximal and distal ends and having a passageway extending throughout the entire length thereof;
a hollow cylindrical housing member being mounted at the distal end of said tubing and having enclosed ends to thereby form a sealed chamber within said housing member, an aperture extending through a wall of said housing member and communicating with said chamber;
an electrode positioned within said chamber;
a conductive lead connected to said electrode and extending out of the housing member and through said passageway of said tubing to the proximal end of said tubing;
retainer means positioned within said housing member for supporting said electrode;
electrolytic material disposed within the chamber of the cylindrical housing member and in contact with said electrode; and,
a biocompatible porous liquid junction comprised of a hydrogel being positioned across said aperture in said housing member so as to form an ion diffusion control barrier between body fluids and the electrolytic material within the chamber in said housing member for providing a stable liquid junction potential in body fluids to provide a substantially voltage stable reference electrode.

4,432,367

ELECTROCARDIOGRAPH RECEIVER

Gregory H. Piesinger, 6702 E. Cactus Rd., Scottsdale, Ariz. 85254

Filed Mar. 3, 1982, Ser. No. 354,373
Int. Cl.³ A61B 5/04
U.S. Cl. 128—639 3 Claims



1. An electrocardigraph receiver for receiving electric impulses produced by the heart muscle of an animal, said receiver comprising:
a first and second electrode means each including an electrode and resilient porous sponge means adapted to absorb an electrically conducting liquid and positioned for completing electrical contact between the associated electrode and an animal's body when the electrode means is pressed thereagainst, said electrode means each further including a housing having the associated electrode fixedly engaged therein with he porous means maintained in proximity to the electrode and extending externally of said housing for providing contact with the animal's body;
means mechanically connecting said first and second electrode means and fixedly positioning said electrode means in spaced apart relationship a distance at least as great as the span of the animal's heart muscle, said mechanical means including an elongated, semi-flexible tubular member having a housing of each electrode means affixed to each end thereof and forming a handle for pressing said

first and second electrode means against the body of the animal; and

means for electrically coupling the electrodes of said electrode means to an electrocardiograph.

4,432,368

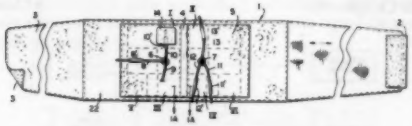
AUTOMATIC ELECTRODE PLACEMENT DEVICE

Allen S. Russek, Medford, N.Y., assignor to Wallant International Trade, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 190,242, Sep. 24, 1980, Pat. No. 4,381,012. This application Jun. 26, 1981, Ser. No. 277,940

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—644 **11 Claims**



1. A device for continuously fixed automatic anatomically correct placement of at least one electrode means against one or more predetermined portions of a body, said at least one electrode means being adapted to transmit electrical signals, said device comprising:

a substantially non-stretchable first portion adapted to be placed against a body portion of a wearer, said first portion having at least one electrode means at at least one electrode receiving position thereon;

means for electrically connecting said at least one electrode means to an electrical signal generating and/or signal receiving device;

touch-type locating means on said first portion and being cooperable with a given body portion of a wearer, said given body portion of the wearer having touch locatable characteristics, for positively automatically locating said device relative to said given body portion of the wearer, said at least one electrode means being a corresponding substantially fixed distance from said locating means so as to be adjacent said one or more predetermined body portions of the wearer each and every time the device is mounted to the body of the wearer, said one or more predetermined body portions being substantially fixed distances from said given body portion which last mentioned fixed distances are substantially the same as respective first mentioned fixed distances; and

means for removably securing said first portion to the body of the wearer with said touch-type locating means adjacent said given body portion of the wearer and with said at least one electrode means adjacent to said one or more predetermined body portions of the wearer;

said locating means comprising means for locating and abutting the sacro-coccygeal joint of a wearer.

4,432,369

ELECTROMAGNETIC SENSOR HAVING THREE ELECTRODES FOR MEASURING SIGNALS INDICATIVE OF A BIOLOGIC CONDITION

Kenneth G. Halvorsen, San Clemente, Calif., assignor to Medi-Tech, Incorporated, Watertown, Mass.

Filed Sep. 4, 1981, Ser. No. 299,628

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—653 **8 Claims**

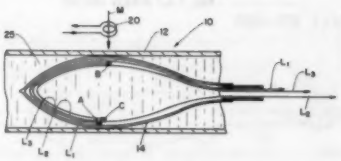
1. An electromagnetic sensor for measuring signals indicative of a biologic condition in a body channel, comprising:

a loop-shaped flat frame having an open end and opposite closed end, and having sides laterally compressible and expansible in the plane of said frame for insertion into said channel in compressed form and expansion therein to contact opposite sides of said channel;

first and second electrodes mounted at opposite sides of said frame and disposable at opposite sides of said channel when said frame is expanded therein for picking up signals generated across said channel;

a third electrode mounted at one side of said frame adjacent said first electrode for picking up signals generated at said one side of said channel;

magnetic means for generating a magnetic field orthogonal to said frame within said channel in the region of said electrodes;



wires connected to said electrodes respectively and carried by said frame, and extending out of said open end of said frame, whereby multiple signals picked up by said electrodes appear on said wires; and

circuit means connected to said wires externally of said frame to receive said picked up signals, said circuit means being adapted to mix first signals picked up across said first and second electrodes, with second signals picked up at said first and third electrode and neutralize one of said first and second signals, leaving only third signals to be passed to a signal measuring means.

4,432,370

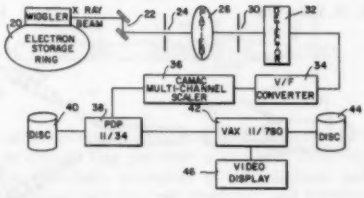
METHOD AND MEANS FOR MINIMALLY INVASIVE ANGIOGRAPHY USING MONO-CHROMATIZED SYNCHROTRON RADIATION

E. Barrie Hughes, Redwood City; Edward Rubenstein, Hillsborough, and Robert Hofstadter, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Oct. 14, 1981, Ser. No. 311,305

Int. Cl.³ A61B *6/00*

U.S. Cl. 128—654 **9 Claims**



1. A method of visualizing arteries such as the coronary artery and other moving arteries comprising the steps of

introducing a small quantity of an iodinated material into the blood stream of a patient,

obtaining a first chromatized X-ray beam from an electron storage ring and auxiliary wiggler at an energy level slightly above 33.16 KeV,

directing said first chromatized X-ray beam through the patient and the blood vessel under examination,

obtaining a first signal indicative of said first chromatized X-ray beam as attenuated by said patient,

obtaining a second chromatized X-ray beam from an electron storage ring and auxiliary wiggler at an energy level slightly below 33.16 KeV,

directing said second chromatized X-ray beam through the patient and the blood vessel under examination,

obtaining a second signal indicative of said second chromatized X-ray beam as attenuated by said patient,

logarithmically subtracting said first signal from said second signal to obtain a third signal, and

controlling a display with said third signal.

4,432,371

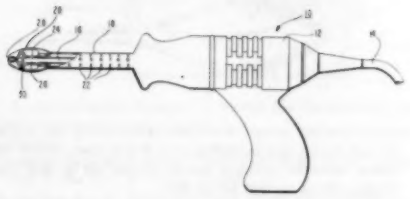
ULTRASOUND SCANHEAD

Robert R. McAusland, Seattle, Wash., assignor to Advanced Technology Laboratories, Inc., Bellevue, Wash.

Filed Jun. 10, 1982, Ser. No. 386,869

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **1 Claim**



1. An improved ultrasound scanhead of the type comprising a housing containing a motor: an armature extending from the motor: at least one ultrasound transducer mounted in a liquid containing transducer housing adjacent one end of the armature, wherein the improvement comprises an impeller comprising a substantially circular disk mounted on the end of said armature, said impeller including a plurality of vanes which extend outward from said disk for causing said liquid to rotate, there being a central opening between said vanes into which any bubbles contained within said liquid will be forced when said impeller rotates, said central opening not being within the zone of transmitted or received ultrasound energy.

4,432,372

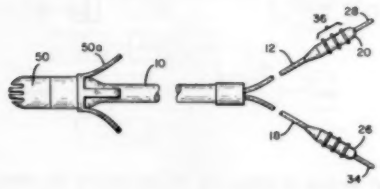
TWO-LEAD POWER/SIGNAL MULTIPLEXED TRANSDUCER

Paul P. Monroe, Janesville, Wis., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 28, 1981, Ser. No. 297,472

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—675 **13 Claims**



1. A body implantable transducer assembly comprising:

a transducer head requiring an electrical power input and supplying an electrical output signal and comprising a piezoresistive resistance bridge having a temporary storage means whereby said electrical output signal is generated by said electrical power input as stored in said temporary storage means passing through said piezoresistive resistance bridge;

means for processing said electrical output signal;

means responsively coupled to said transducer head and said processing means for conducting said electrical output signal between said transducer head and said processing means; and

means responsively coupled to said conducting means for supplying said electrical power input to said transducer head via said conducting means.

4,432,373

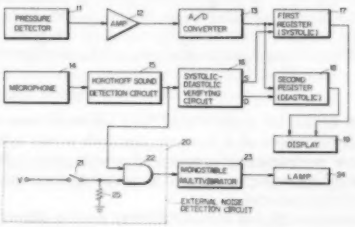
ELECTRONIC BLOOD PRESSURE MEASURING APPARATUS

Hiroshi Ogawa, Nagaokakyo; Syozi Kimura, Kameoka, and Yoshinori Miyawaki, Yawata, all of Japan, assignors to Omron Tateisi Electronics Company, Hanazono, Japan

Continuation of Ser. No. 122,740, Feb. 19, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,255

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—680 **3 Claims**



1. In an electronic pressure measuring apparatus comprising pressure detecting means operatively connected with a cuff for detecting a pressure at the cuff, Korotkoff sound detecting means associated with the cuff for detecting any Korotkoff sound output signal and verifying means operative in response to the Korotkoff sound detecting means output signal generated by the Korotkoff sound detecting means for determining systolic and diastolic blood pressures,

the improvement comprising signal detecting means for detecting the generation of a Korotkoff sound detecting means output signal by said Korotkoff sound detecting means and generating a signal detecting means output signal and indicator means operative in response to said signal detecting means output signal for displaying the generation of said Korotkoff sound detecting means output signal,

wherein said signal detecting means includes a check switch and an AND circuit adapted to receive both an output signal from said check switch and said Korotkoff sound detecting means output signal,

the check switch further being adapted so that prior to a blood pressure measurement the check switch is closed and remains in an "on" position for a predetermined time period,

and wherein said signal detecting means further includes a display means operative in response to the AND circuit that signals the generation of said Korotkoff sound detecting means output signal by said indicator means as a warning signal of an improper measurement condition.

4,432,374

PLETHYSMOGRAPHIC ACCELERATION PULSE WAVE METER

Hiroshi Osanai, Miyamaedaira Green Heights 17-403, Mukogaoka 430, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan

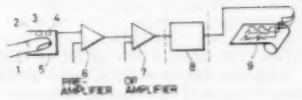
Filed Nov. 25, 1981, Ser. No. 325,012

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—694 **6 Claims**

1. A plethysmograph comprising a sensor for detecting an

increase or decrease in the blood volume of a vascular bed, means producing a pulse waveform signal representative of blood volume, means twice differentiating said pulse waveform signal, means producing an output signal representative of an acceleration pulse wave from said differentiated waveform signal, and means displaying said output signal for analysis of the circulatory system.

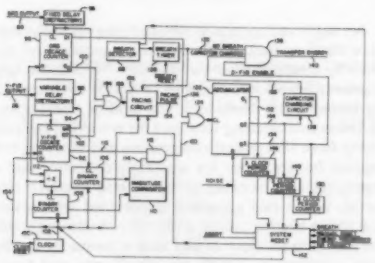


4,432,375

CARDIAC ARRHYTHMIA ANALYSIS SYSTEM

James H. Angel, Aurora, Oreg., and Alfred L. Aronson, New York, N.Y., assignors to Cardiac Resuscitator Corporation, Wilsonville, Oreg.

Filed May 24, 1982, Ser. No. 381,541
Int. Cl.³ A61B 5/04
U.S. Cl. 128—705 **10 Claims**



1. A system for monitoring the cardiac electrical activity and at least one other selected life sign of a patient and triggering the application of appropriate therapeutic current to the patient, comprising:

(a) input means for receiving from said patient an electrocardiac signal representative of the electrical activity of said patient's heart and a second signal derived from said other selected life sign and indicative of the occurrence of a second criterion for the identification of selected cardiac arrhythmia;

(b) V-fib circuit means, responsive to said electro-cardiac signal, for repetitively producing V-fib pulses at a rate greater than or equal to a first predetermined rate in response to the occurrence of ventricular fibrillation and producing at least one V-fib pulse in response to the occurrence in said electro-cardiac signal of a QRS complex;

(c) QRS circuit means, responsive to said electro-cardiac signal, for producing a QRS pulse in response to the occurrence in said electro-cardiac signal of a QRS complex while producing in response to ventricular fibrillation QRS pulses at less than half the rate of V-fib pulses produced by said V-fib circuit means; and

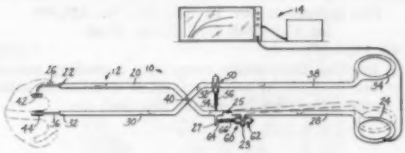
(d) logic means, responsive to said V-fib pulses, said QRS pulses, and said second signal, for producing periodic pacing trigger signals upon the occurrence of V-fib pulses and QRS pulses both at less than a second predetermined rate and of said second criterion.

4,432,376

METHOD FOR DETERMINING THE EXTENSIBILITY OF SELECTED NON-EXCISED TISSUE OF THE UTERINE CERVIX, EAR OR SKIN

Gabor B. Huszar, 16 Chestnut La., Woodbridge, Conn.

Filed Jan. 30, 1980, Ser. No. 230,369
Int. Cl.³ A61B 5/10
U.S. Cl. 128—774 **8 Claims**



1. A method for measuring the modulus curve of extensibility for selected nonexcised tissue of the uterine cervix comprising:

(a) positioning the tissue at the lip of the uterine cervix between two members;

(b) applying an increasing compressive force to the tissue which increases from a minimum force to a maximum force;

(c) measuring the instantaneous force applied and the displacement of tissue resulting from said force over the range of forces applied;

(d) calculating the ratio of the instantaneous force applied to the displacement resulting therefrom;

(e) deriving the modulus curve of extensibility for the uterine tissue from the calculated ratios; and

(f) displaying the modulus curve of extensibility over the range of forces applied.

4,432,377

BIOMEDICAL LEAD WITH RING ELECTRODE AND METHOD OF MAKING SAME

Eugene A. Dickhudt, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 29, 1982, Ser. No. 344,125
Int. Cl.³ A61N 1/04
U.S. Cl. 128—786 **8 Claims**

1. A method of making a body implantable lead of the type having an exposed ring electrode, a lead body comprising a conductor electrically connected to said electrode and an insulating casing enclosing said conductor and forming the external portion of said lead body, said casing being of a pliable material generally inert to body fluids, comprising the steps of:

slipping said casing and said conductor into said ring electrode so that the conductor is electrically connected to the ring electrode; and

forcing ends of said ring inward until they embed themselves into said casing.

6. A body implantable lead of the type having an exposed ring electrode, a lead body comprising a conductor electrically connected to said electrode and a casing enclosing said conductor and forming the external portion of said lead body, said casing being of a pliable material generally inert to body fluids, wherein said electrode comprises a conductive cylinder having ends embedded in the material of the casing to form a barrel, the barrel having a maximum diameter between the ends of said barrel greater than the diameter of said casing, and the

embedded ends of said conductive barrel having a diameter less than the diameter of said casing.

4,432,378

SUBSTITUTED CYCLOHEXANE DERIVATIVES

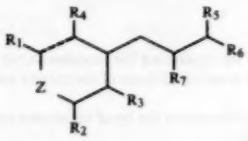
Brian J. Willis, Bergenfield, N.J., and Robert G. Eilerman, Merrick, N.Y., assignors to Fritzsche, Dodge & Olcott, Inc., New York, N.Y.

Division of Ser. No. 116,839, Jan. 30, 1980, Pat. No. 4,326,996. This application Nov. 30, 1981, Ser. No. 325,989

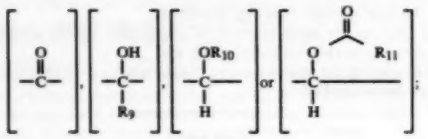
Int. Cl.³ A24B *3/12, 15/36, 15/40*

U.S. Cl. 131—277 **1 Claim**

1. A smoking composition comprising a smoking material and at least 0.0001% by weight of one or more of the substituted cyclic compounds having the structure:



wherein the dotted line may be a carbon-carbon double bond or a carbon-carbon single bond; wherein each of R_1, R_2, R_3, R_4, R_5, R_6 and R_7 may be hydrogen or lower alkyl; wherein Z may be any of the following:



wherein R_9 is hydrogen or lower alkyl; and wherein R_{10} and R_{11} are lower alkyl.

4,432,379

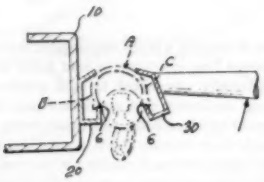
METHOD AND APPARATUS FOR HANDLING A COIN HOLDER

Ross H. Cantley, 577 Essex Rd., Beaconsfield, Quebec H9W 3V8, Canada

Filed Apr. 6, 1983, Ser. No. 482,439

Int. Cl.³ G07D *9/00*

U.S. Cl. 133—1 R **20 Claims**



1. An apparatus for handling a resilient coin holder of the type having terminal ends and a coin-receiving mouth extending longitudinally thereof and defined by opposed side walls of the holder through which coins are received laterally thereof, comprising in combination:

(a) frame means;

(b) a first jaw member on said frame means, said first jaw member adapted to receive and engage with a first side wall of the coin holder when placed on said apparatus; and

(c) a second jaw member adapted to receive and engage with a second side wall of said coin holder, said second jaw member being so arranged as to permit movement thereof relative to said first jaw member whereby to displace said first and second side walls relative to one another to permit coins within said holder to be released therefrom.

4,432,380

APPARATUS FOR REMOVING OPTICAL COMPONENT BLANKS FROM A BLOCKING TOOL

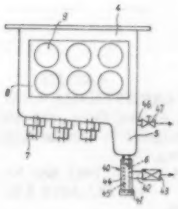
Hans R. Ruf, Illnau; Rolf Quattländer, Effretikon; Max Reichlin, Illnau, and Patrik Hilpert, Volketswil, all of Switzerland, assignors to Roag, Illnau, Switzerland

Filed May 7, 1982, Ser. No. 376,003

Claims priority, application Switzerland, Jun. 24, 1981, 4186/81

Int. Cl.³ B08B *3/12*

U.S. Cl. 134—104 **8 Claims**



1. An improved apparatus for removing optical components from a blocking tool, which optical components are mounted thereto by means of a low melting alloy, which said apparatus comprises a heated liquid bath and a source of ultrasonic vibrations intended for deblocking said optical components from their respective blocking tools and for removing any mounting material from said optical components and blocking tools and comprises further means for separately collecting said optical components, said blocking tools and said removed mounting material, which said apparatus is provided with a tank provided with a heating means; a plurality of ultrasonic transducers mounted to the floor of said tank; a means for holding said optical components, which are placed into said tank and a collecting grid intended for collecting deblocked blocking tools;

the improvement comprising a sump located at the bottom of said tank, which said sump is provided with a discharging means for collecting and discharging any removed mounting material; comprising further a second heating means arranged at said sump and said discharging means and intended to keep removed mounting material in a liquid state of aggregate; comprising further a supporting rack, whereby said collecting grid is a section of said supporting rack, which said supporting rack is arranged to receive said holding means for said optical components and said blocking tools; and comprising a further means for moving said optical components including said blocking tools relative to said ultrasonic transducers and arranged to be suspended at said supporting rack.

4,432,381

WINDBREAKER

George Greenbaum, 790 Boylston St., Boston, Mass. 02199

Filed Jun. 9, 1982, Ser. No. 386,734

Int. Cl.³ A45F *1/00*; **A01G** *9/00*

U.S. Cl. 135—87 **10 Claims**

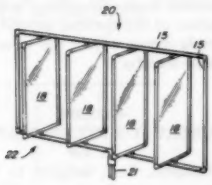
1. A structure which comprises:

a post comprised of a plurality of rods, the rods assembled in parallel relationship to define channels between them on their composite outer surface and their composite inner

surface, and the upper ends of the rods spaced from one another when in a clamped position;

means to clamp the rods one to the other, said means having an inner surface with projections extending therefrom some of said projections mating with some of said channels, the projections inhibiting the movement of the rods one to the other when the post is subject to stress;

a plurality of grooved rods secured one to the other to define a frame;



means to secure the frame to the post, said means adapted to be slidably received on the upper ends of the rods in their clamped position, said means adapted to slidably receive the ends of at least some of the grooved rods of the frame; and

sheet material secured to the frame by a resilient tube-like strip, which strip carries the sheet material with it into the grooves of the rods.

4,432,382

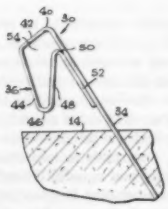
TENT STAKE

Jerrold M. Wolf, 4880 Dogwood Ave., Seal Beach, Calif. 90740

Filed Mar. 24, 1982, Ser. No. 361,439

Int. Cl.³ A45F 1/16, 1/18

U.S. Cl. 135—118 **12 Claims**



1. A tent stake, said tent stake having a body of elongated wire-like metal having a uniform cross section, said tent stake body having a straight, elongated shank for earth engagement, said shank having a tip on one end of said body, said body having a head thereon at the end of said straight shank opposite said tip, said straight shank terminating at a striking corner where said shank joins said head, said head being formed of a top leg directed away from said straight shank at the bend at said striking corner, said top leg being directed at an acute angle with respect to said straight shank, a downwardly extending leg attached to said top leg at a bend therebetween, said downwardly extending leg being oriented at an acute angle with respect to said straight shank, a hook bend formed on said body between said downwardly extending leg and a hook leg on the side of said hook bend away from said downwardly extending leg, said hook leg extending at an acute angle with respect to said straight shank, said head including a final leg on said body beyond said hook leg, a final bend in said body between said hook leg and said final leg so that a hook is formed between said hook leg and said final leg, said final leg lying against at least a portion of said straight shank.

4,432,383

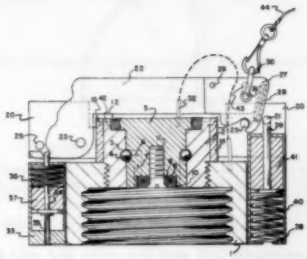
ATTACHMENT FOR SAFETY VALVES

Lewis D. Boyette, P.O. Box 5492, Pensacola, Fla. 32505

Continuation of Ser. No. 30,422, Apr. 16, 1979. This application Oct. 15, 1981, Ser. No. 311,593

Int. Cl.³ F16K 17/40

U.S. Cl. 137—77 **2 Claims**



1. Control apparatus for controlling a valve assembly, said assembly comprising a main housing having walls defining a passageway extending along an axis and a valve actuating stem movable within said passageway along said axis, said control apparatus comprising:

(a) an auxiliary housing mountable on said main housing;

(b) restraining block means for engaging the end of said valve stem;

(c) engagement means on said block means and on said auxiliary housing for normally supporting said block means in a locked position along said axis wherein said block means prevents axial movement of said valve stem, said engagement means comprising bearing means for providing rolling contact between said restraining block means and said auxiliary housing when said block means is rotated from said locked position to said released position; and

(d) selectively actuatable release means for rotating said restraining block means from said locked position to a released position wherein said block means and said stem are free to move along said axis;

(e) said block means being in the general form of a cylinder received within a generally cylindrical bore extending along said axis in said auxiliary housing, said bearing means comprising at least one spherical ball partially received in a generally circumferentially extending groove in said bore and partially received in a generally circumferentially extending groove portion in the periphery of said cylinder, at least one of said cylinder and cylindrical bore further comprising a third groove communicating with said circumferentially extending groove in said one of said cylinder and said cylindrical bore, said third groove permitting axial movement of said cylinder when said ball is positioned within said third groove.

4,432,384

SEWER FLUID TRAP

Marcel Guiboro, 124 Renaud St., Ile Perrot, Province of Quebec, Canada (J7V 5X5)

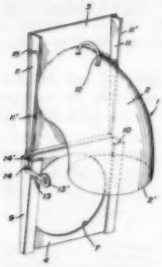
Filed Mar. 18, 1982, Ser. No. 359,207

Int. Cl.³ F16K 9/00

U.S. Cl. 137—247.11 **4 Claims**

1. A sewer fluid trap comprising, in combination, a manhole having a catch-basin and a sewer pipe opening into said manhole; a first plate having a fixed central hole adapted to be permanently installed on the manhole wall around said sewer pipe, such that said central hole is in registry with the latter; said flat plate being formed with a pair of lateral vertical slots; a back-plate adapted to overlie said first plate between said lateral slots; downwardly-depending elbow rigidly secured at

its top end to said back-plate; the latter being provided with a second central hole in registry with said elbow; said elbow being open at its lower end, the latter being adapted to be submerged in said catch-basin; remotely-controlled latch



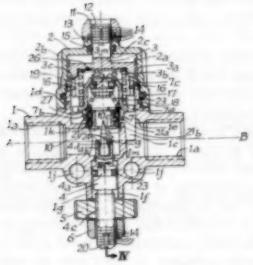
means to positively lock said first plate and said back-plate together; and lift means to remove said elbow and said back-plate, whereby unlatching and lifting of said elbow and back-plate can be carried out without it being necessary to descend into said manhole.

4,432,385

DEVICES FOR REGULATING THE FLOW AND THE PRESSURE OF GASEOUS FLUIDS

Andre Legris, Saint Maur, France, assignor to Legris S/A, Rennes, France

Filed Apr. 16, 1981, Ser. No. 254,619
Claims priority, application France, Apr. 23, 1980, 80 09143
Int. Cl.³ F16K *17/18*
U.S. Cl. 137—271 **25 Claims**



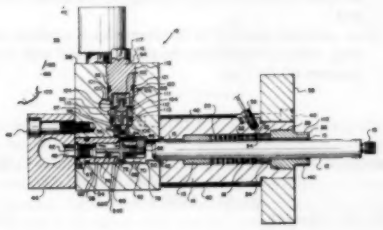
1. Energy saving improvement to a device for regulating the flow and pressure of compressed gases, said device being installed in a conduit connecting the outlet of a control valve to a pressure-using apparatus to regulate the pressure toward the pressure-using apparatus and the flow in the reverse direction, wherein said device comprises a main body having aligned inlet and outlet nozzles, said body having a main valve seat connected to said inlet nozzle, a valve chamber member, a main valve carried by said valve chamber member at one end thereof for movement therewith, first resilient means for urging said main valve into engagement with said main valve seat, first manually operable means for adjusting the force exerted by said first resilient means, said first manually operable means comprising visible indicator means extending in a variable manner externally of said first manually operable means, said main valve ensuring a reduction of the gas pressure in the direction of the pressure-user apparatus, said valve chamber comprising at the other end thereof a secondary valve and second one-way acting resilient means for urging said secondary valve closed, said second resilient means being relatively weak so that when the main valve is closed the secondary valve is adapted to occupy an open position for the passage of gas flowing in from the pressure-user apparatus, a nozzle formed in the main valve, a needle valve cooperating with said main valve nozzle for controlling the flow of said gas flowing in from the pressure-user apparatus, and second manually operable means for adjusting the position of said needle valve, said second manually operable means comprising second visible indicator means extending in a variable manner externally of said second manually operable means, each of said visible indicator means comprising markings corresponding to the position of the member moved by the associated manually operable means and to the value of the flow and pressure regulated thereby.

4,432,386

VALVE ASSEMBLY FOR RECIPROCATING PLUNGER PUMP

Amos Pacht, Houston, Tex., assignor to Butterworth, Inc., Houston, Tex.

Division of Ser. No. 853,113, Nov. 21, 1977, Pat. No. 4,277,229.
This application Dec. 19, 1980, Ser. No. 218,129
Int. Cl.³ F16K *15/06*
U.S. Cl. 137—327 **6 Claims**



1. A valve assembly adapted to be inserted in a cylindrical valve chamber in a cylinder block of a reciprocating high pressure pump and retained in said chamber by a manifold member removably secured to said cylinder block, said valve chamber having a shoulder formed by said block at the inner end of said chamber, said valve assembly comprising:

an elongated cylindrical tubular valve seat member adapted to be slidably insertable in said chamber and retained in said chamber by said manifold member, said seat member having a bore extending longitudinally therethrough and including a threaded portion for engagement with a disassembly tool to remove said seat member from said valve chamber, and a valve seat surface formed at the inner end of said bore;

a valve member including a cylindrical disc portion engageable with said surface on said seat member for closing off fluid flow through said bore, said valve member including a pluraity of longitudinal guide ribs projecting from said disc portion and insertable in said bore for guiding said disc portion for reciprocation with respect to said seat member to open and close said valve;

a valve guide member including a base portion and a plurality of circumferentially spaced apart arms which extend longitudinally from said base portion and are adapted to engage a transverse end face of said seat member around said disc portion, said base portion including a plurality of concave exterior wall surface portions between said arms and forming recesses to permit the flow of fluid through said chamber from said bore, said base portion extending to engagement with said shoulder in said chamber whereby said guide member is retained in said chamber by being clamped between said shoulder and said seat member, said guide member including a central threaded bore

in said base portion for engagement with a disassembly tool to remove said guide member from said bore; and

spring means disposed between said base portion and said valve member and adapted to bias said valve member in the valve closed position against said seat member.

4,432,387

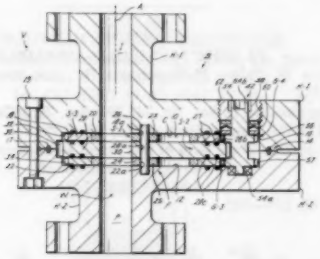
ROTATING DISC GATE VALVE

Don G. Sims, 4530 Briarhollow, Houston, Tex. 77027

Filed Sep. 20, 1982, Ser. No. 420,032

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—329.02 **17 Claims**



1. A rotating disc gate valve for controlling fluid flow in a flow line, comprising:

a valve body having formed therein a fluid passageway and a cavity extending transversely to said passageway; and,

a flow control assembly mounted with said valve body cavity, including:

first and second valve seat carriers mounted within said valve body cavity, said valve seat carriers each having a plurality of valve seats which are alignable with valve seats in the other valve seat carrier to form valve seat sets, said valve seat sets are alignable with said passageway;

carrier rotation means mounted with said valve body for rotating said valve seat carriers to a plurality of positions in which one of said valve seat sets are aligned with said passageway;

a rotatable flow control disc having formed therein a flow control port alignable with said valve seat sets;

flow control disc rotation means mounted with said valve body for rotating said flow control disc between an opened and closed position, said flow control port of said flow control disc being simultaneously aligned with said valve seat sets and said fluid passageway in the opened position; and

said sets of seats of said valve seat carriers providing the rotating disc valve with multiple sets of seats whereby said valve seat set alignable with said valve body passageway is replaceable without dismantling of said valve body.

4,432,388

DEVICE FOR PREVENTING SEWAGE BACKUP IN DRAIN LINES

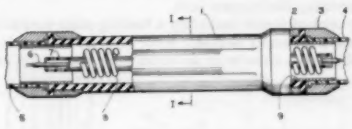
Jerome Rest, 8827 N. Ewing Ave., Skokie, Ill. 60203

Filed Jan. 7, 1982, Ser. No. 337,611

Int. Cl.³ F16K *31/128*

U.S. Cl. 137—403 **9 Claims**

1. A device for automatically preventing the backup of sewage in a gravity discharge drain line consisting of an expansible bladder in conjunction with a reverse flow detector, means for inserting said device to a remote section in said drain line, a pressure source for expanding said bladder to a predetermined pressure to block reverse flow upon signal from said reverse flow detector, electrical and mechanical means for remote automatic operation of said device, said electrical and mechanical means containing elements for return of said device to normal standby position when the backup condition is rectified.



4,432,389

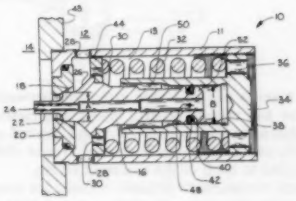
RESEAT RELIEF VALVE

Alan D. Jackson, and Kenneth E. Day, both of Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Feb. 16, 1982, Ser. No. 349,101

Int. Cl.³ F16K *17/20*

U.S. Cl. 137—469 **7 Claims**



1. A fluid relief valve adapted to be utilized in a hydraulic system comprising:

a body member defining a chamber therein;

inlet and outlet openings in the body;

a beveled circular seat located in the outlet opening;

biasing means in the chamber;

an axially movable pressure responsive poppet in said chamber having an annular sealing surface engageable with said seat approximate one end thereof acting in conjunction with the biasing means to close the valve;

an enlarged end spaced at the opposite end of the poppet with a sealing means therearound;

a guide sleeve means in the body having an axial bore therein for receipt of the enlarged end to guide the longitudinal movement of the poppet while allowing the poppet to rotate about the enlarged end through a limited angle to align the sealing surface with said seat.

4,432,390

REMOTELY ADJUSTABLE CONTROL PRESSURE BY-PASS AND SHUT-OFF VALVE

Eugene L. Brazil, P.O. Box 505, Corcoran, Calif. 93212

Filed Oct. 5, 1981, Ser. No. 308,612

Int. Cl.³ F16K *31/52, 3/32;* F16C *1/10*

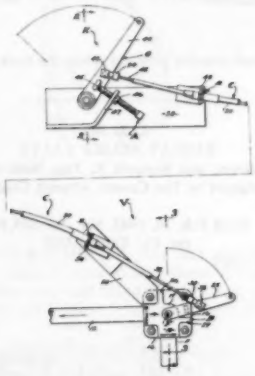
U.S. Cl. 137—625.46 **8 Claims**

1. The combination of a by-pass and shut-off valve and remote adjustable control means therefor for use where the supply of fluid varies with respect to pressure-volume;

the by-pass valve including a chamber with an operating stem entering therein and rotatable freely between opened and closed positions, and with an inlet port from a variable pressure-volume supply line, and with separate outlet and by-pass ports angularly separated about the stem, the outlet port being convergent toward its closure side and with a vertex for gradually diminishing flow and opening to a useful fluid line, and the by-pass port being open to a

return line, and a valve element positioned by the stem rotated by a lever to open the outlet port while closing the by-pass port and alternately to close outlet port while opening the by-pass port,

the control means including a bearing plate rotatably carrying a manually shiftable lever with an adjustable stop for the valve element in an outlet port open position



there being a control cable extending between the by-pass valve and remote control means and including a casing anchored to the by-pass valve and control means respectively and a reciprocable element free to shift therein and coupled to each of the aforesaid levers,

whereby variations in pressure-volume are compensated for in the by-pass valve through preset manual adjustment of said control means therefor.

4,432,391

IMPULSE VALVE

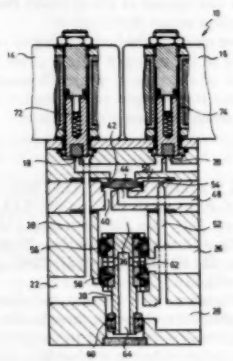
Helmut Ott, Stuttgart, Fed. Rep. of Germany, assignor to Herion-Werke KG, Feilbach, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,185

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038802

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—625.64 **10 Claims**



10. An impulse valve having a housing formed with an inlet port for a pressure medium, a pressure-release port, a pressure relieving channel, at least two working ports and a working chamber; a main piston movable in the chamber between predetermined switching positions; a solenoid-operated preliminary control valve having a valve seat connected to a connection channel; said preliminary control valve controlling communication between the connecting channel and said inlet port; a valve member arranged between the connection channel and said working chamber and being movable into a first position in which the working chamber is connected to the pressure-relieving channel and a second position in which the working chamber is connected to the inlet port; and a control channel permanently connecting one of said working ports with said valve member to bias the same by pressure in the one working port towards said second position of the valve member, whereby said main piston remains in a switching position adjusted by said preliminary control valve even when the latter is inactivated.

4,432,392

PLASTIC MANIFOLD ASSEMBLY

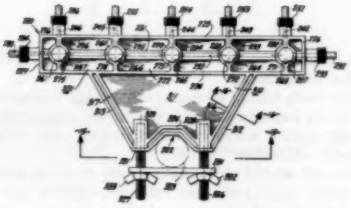
Hyman W. Paley, 25 Broadmoor Dr., San Francisco, Calif. 94132

Continuation of Ser. No. 727,791, Sep. 29, 1976, Pat. No. 4,177,835. This application May 29, 1979, Ser. No. 43,452

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.³ E03B *7/07*

U.S. Cl. 137—883 **8 Claims**



1. In a manifold assembly: a generally planar body fabricated as a unitary structure of a substantially rigid plastic material including a longitudinally extending rib and a plurlity of laterally extending ribs intersecting the longitudinally extending rib, each of said ribs being formed to include an axially extending flow passageway, valve bores formed in the body at the intersections of the ribs and extending in a direction normal to the passageways, and valve members rotatively mounted in the bores for controlling communication between the passageways.

4,432,393

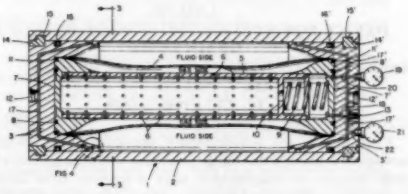
ACCUMULATOR

Carl R. Mills, East Dundee, Ill., assignor to Chicago Fluid Power Corp., Streamwood, Ill.

Filed Dec. 20, 1982, Ser. No. 451,077

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **12 Claims**



1. In a sleeve-type bladder accumulator having an outer generally cylindrical body, an apertured generally cylindrical

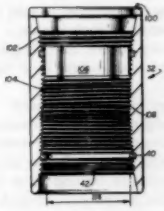
stop tube concentrically disposed within the cylindrical body, and an elastic tubular bladder sleeve partially enveloping the stop tube with each end of the sleeve being anchored by a bladder retainer carried on the adjacent end of the stop tube and an end cap fixed to the adjacent end of the cylindrical body, the improvement comprising clamping means disposed between one end of the stop tube and the adjacent end cap exerting a force upon the stop tube tending to move the stop tube away from that end cap and toward the opposite end cap, and sealing means made more secure by the force generated by the clamping means.

4,432,394

GROOVED COUPLING PROTECTOR

Dennis E. Martin, 170 Moonraker Dr., Slidell, La. 70458

Filed Jun. 21, 1982, Ser. No. 390,660
Int. Cl.³ B65D *59/00*; F16L *57/00*
U.S. Cl. 138—96 T **11 Claims**



1. A system for protecting threaded couplings during transportation and/or handling comprising in combination:

a coupling having opposing end portions each defining a coupling face, said coupling including interiorly tapering walls between said end portions and the midpoint of said coupling and defining a threaded cavity therebetween, said coupling including first and second axially disposed grooves carrying first and second seal rings each defining an interior space, respectively, said first groove and seal ring positioned between one end and said midpoint and said second groove and seal ring positioned between said other end and said midpoint;

at least one protecting member for threaded engagement in one of said end portions and including a threaded portion for threadably engaging with said threaded cavity above said seal ring and a substantially smooth portion dimensioned so as to closely fit in the interior space defined by the respective said seal ring, said at least one protector further including flange means for preventing damage to the coupling face of said one of said end portions and for permitting said at least one protector to be grasped.

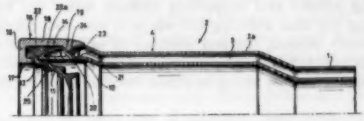
4,432,395

PIPE PART WITH SOCKET PROVIDED WITH LONGITUDINALLY EXTENDING CHANNELS

Joannes H. Beune, Hardenberg, and Roelof H. Marissen, Bergentheim, both of Netherlands, assignors to Wavin B.V., Netherlands

Division of Ser. No. 108,049, Dec. 28, 1979, Pat. No. 4,344,461. This application Apr. 21, 1982, Ser. No. 370,536
Int. Cl.³ F16J *15/10*
U.S. Cl. 138—109 **11 Claims**

1. A plastic pipe part with a socket, a wall of said pipe part being provided with longitudinally extending channels, said channels extending into the wall of the socket at least over a part of the length of the socket, a retaining ring, said retaining ring together with said socket forming an annular end groove chamber, said retaining ring being fixed to the outer side of the socket by an adhesive; and a sealing sleeve, said sealing sleeve



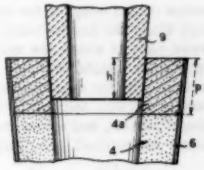
being connected with a sealing member part received in said annular end groove chamber.

4,432,396

CASTING TUBE

Jean-Charles Daussan; Gerard Daussan, both of Metz, and Andre Daussan, Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed May 17, 1982, Ser. No. 378,603
Claims priority, application France, May 27, 1981, 81 10519
Int. Cl.³ F16L *9/10*; B22D *41/02*
U.S. Cl. 138—109 **7 Claims**



1. A casting tube to be engaged tightly around the casting nozzle of a first metallurgical vessel and to be immersed in the molten metal which is being poured into a second vessel placed beneath the first vessel, said casting tube being constituted by a mixture of refractory particles and fibers embedded in a binder which is not capable of withstanding the temperature to which the casting tube is heated when liquid metal flows within the interior of said tube whereas the refractory particles are sinterable in a tube zone which is directly exposed to the heat of the liquid metal, wherein said casting tube also contains a refractory binder which is resistant to the heat of the liquid metal and is provided at least in the end zone of said tube which is to be engaged around said casting nozzle, which is not directly exposed to said heat.

4,432,397

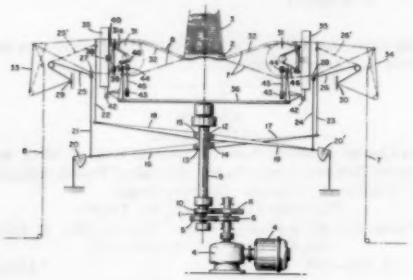
NOISELESS HIGH-SPEED CIRCULAR LOOM FOR PRODUCING TUBULAR FABRICS CONSISTING OF STRIPS, THREADS AND THE LIKE MADE OF SYNTHETIC OR NATURAL MATERIALS

Beniamino Cacciapuoti, Aulla, Italy, assignor to Moplefan S.p.A., Milan, Italy

Filed Nov. 27, 1981, Ser. No. 325,596
Claims priority, application Italy, Dec. 12, 1980, 26612 A/80
Int. Cl.³ D03D *37/00*
U.S. Cl. 139—13 R **6 Claims**

1. A circular loom for tubular fabrics made of threads and/or strips of polymeric, natural and similar materials, of the type with heddles arranged on two concentric circles and with a central driving shaft, characterized in that it comprises, for the alternate spreading apart of the internal and external warp threads, a supporting member, mounted coaxially and rotating around the central and vertical shaft of the loom, on which supporting member one or more pairs of wings or circular sectors diametically opposed to one another are coupled at a predetermined angle of inclination to the axis of said central shaft, each pair of wings being coupled in an inclined manner

on said supporting element with interposition of a roller bearing so as to prevent said wings, through means oscillatorily connecting such wings with fixed parts of the loom, from rotating around said supporting element when the loom is working and thus allowing the wings to assume a continuous undulatory motion, the end portions of said opposite wings being connected, through a plurality of tie rods, with eye-bearing elastic elements acting as elastic heddles so as to transmit



the undulatory motion of said wings to the elastic heddles and therefore to achieve, along the development of the loom reed and by utilizing more pairs of wings, the necessary spreading apart of the warp threads adapted to form the wave pitch; rolling means associated with the usual shuttle-pushing devices as well as multi-wheel devices, associated with the shuttles, capable of providing a support, and a guide for the shuttles on the blade reed being furthermore provided for the shuttle control or drive.

4,432,398

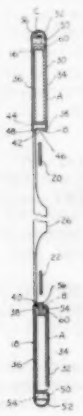
WRAPAROUND ADJUSTABLE CENTER BRACE ATTACHMENT

Stephen J. Root, Mauldin, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Jun. 16, 1982, Ser. No. 388,893

Int. Cl.³ D03C 9/06

U.S. Cl. 139—91 **5 Claims**



4. In a heddle frame construction for a loom of the type which includes a top and bottom frame slat, a heddle rod carried by each frame slat which support heddles in the frame, at least one center brace carried vertically between said top and bottom frame slats, said bottom frame slat being adapted for driving connection with a heddle frame drive assembly, an adjustable attachment element carried by said top and bottom slats attaching said center brace thereto comprising:

sleeve means slidably carried on said top frame slat and said bottom frame slat;

said sleeve means wrapping around said respective frame slats and including opposing edge portions having hook means engaging said slats;

a longitudinal slot defined between opposing edge portions across a first end of said sleeve means;

a first block means carried on opposing ends of said center brace including an open groove formed in an upper surface thereof defined by upstanding edge means on each side of said open groove;

said hook means fitting over said edge means of said first block means fastening said center brace between said top and bottom frame slats;

second block means carried adjacent a second end of each said sleeve means remote from said first end of said sleeve means;

said first and second block means having vertical threaded openings extending therethrough;

threaded locking means received in said threaded openings of said first and second block means;

said threaded locking means clamping said sleeve means against said frame slats when in a tightened clamping position;

access means formed in said first means;

said threaded locking means being operationally accessible through said access means from a vertical direction from above said top and bottom frame slats on said heddle frame carried vertically on said loom facilitating adjustment of the longitudinal position of each said sleeve means on said frame slats without obstruction from below the heddle frame.

4,432,399

FILLING-THREAD MONITORING DEVICE FOR JET LOOMS

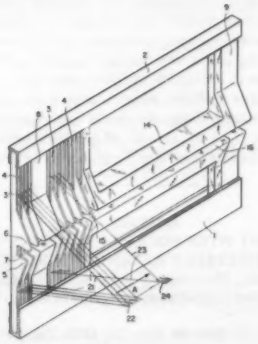
Hans Bachmann, Charlotte, N.C., and Robert Frey, Ruti, Switzerland, assignors to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,424

Claims priority, application Switzerland, Nov. 25, 1980, 8686/80

Int. Cl.³ D03D 51/34

U.S. Cl. 139—370.2 **13 Claims**



1. A filling-thread monitoring device for jet looms in which the filling thread is guided during its insertion into the shed, in a first guide channel which is partially open on the side and formed by spaced members having a first filling thread stop motion means for the giving off of a signal when the filling thread introduced is less than its normal length and having a second filling thread stop motion means spaced from the latter

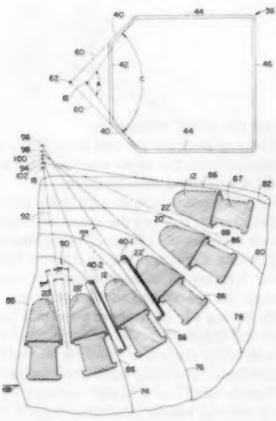
to give off a signal when the filling thread introduced exceeds its normal length by a predetermined amount, characterized by the fact that between the two filling thread stop motion means there is arranged a guide member having a second guide channel which is open at its entrance and exit ends, is closed in the filling direction on substantially all sides, and lies in the extension of the first guide channel.

4,432,400

COIL INSERTION METHOD AND APPARATUS USING NON-PARALLEL BLADE GAPS

Robert G. Walker, Ossian, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Jul. 20, 1981, Ser. No. 285,429
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—92.1 **26 Claims**



1. In a method of winding dynamoelectric machine field coils and inserting the same in an internally slotted core member using coil insertion apparatus having a cylindrical array of elongated, parallel, circumferentially spaced blade elements defining equal-width gaps therebetween respectively radially aligned with the centerline of the array, the blade elements respectively having distal ends, the method including the steps of single-layer, precision winding a coil having two converging angled sections respectively joined to opposite end sections, moving the array relative to the coil to a first position in which the distal ends of a group of adjacent blade elements extend into the coil generally at right angles thereto with the angled sections of the coil respectively extending through the two gaps respectively adjacent the outer blade elements of the group and one end section disposed within the array, said two gaps defining a first angle therebetween, moving the array with the coil on said group of blade elements relative to the core member to a second insertion position with the blade elements extending into the bore of the core member and inserting the coil in the core member slots, the improvement comprising: providing the array of blade elements with at least said two gaps tapered in planes perpendicular to the array centerline and having sides which diverge toward the center of the array; winding the coil from wire having a diameter closely approaching the width of the gaps with said two angled sections defining a second angle therebetween slightly smaller than said first angle and with the projected centerlines of said angled sections meeting at a first point spaced outwardly from the centerline of the array on the side thereof remote from said one end section when the array is in said first position thereof, pivoting the coil on the group of blade elements to a position defining an acute angle therewith whereby said two angled sections of said coil project a third angle therebetween slightly larger than said first angle with the projected centerlines of said angled sections meeting at a second point spaced inwardly from the centerline of the array on the side thereof toward said one end section when the array is in said insertion position thereof.

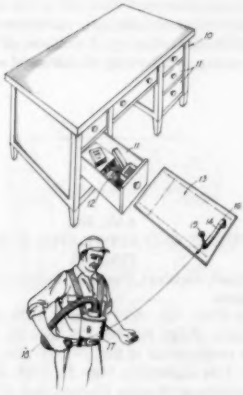
17. In apparatus for winding dynamoelectric machine field coils and inserting the same in an internally slotted core member including a cylindrical array of elongated, parallel, circumferentially spaced blade elements defining equal width gaps therebetween respectively radially aligned with the centerline of the array, the improvement wherein said blade elements respectively have opposite sides which define said gaps, the facing sides of each pair of adjacent blade elements being substantially flat and diverging toward the centerline of the array to define an inwardly facing angle therebetween, the radii of said cylindrical array with which said gaps are aligned respectively substantially bisecting said angles.

4,432,401

STABILIZER FOR THE CONTENTS OF FURNITURE DRAWERS DURING FURNITURE MOVING AND METHOD

Edward R. Katz, 4847 Cambridge Dr., Dunwoody, Ga. 30338

Filed Jul. 19, 1982, Ser. No. 399,444
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—4 **3 Claims**



1. A method of preparing a furniture unit having drawers with contents for moving, comprising partly opening the drawers with their contents in place while the furniture unit is in a normal upright position, placing inflatable contents stabilizers on top of the contents in the drawers while the stabilizers are in a deflated state, inflating the stabilizers while the drawers are partly open to expand the stabilizers into firm pressure contact with the drawer contents and against the bottoms of adjacent uppermost drawers, and fully closing the drawers with the inflated contents stabilizers therein to enable safe movement of the furniture unit without displacement of the drawer contents.

4,432,402

SELF-ELEVATING WOOD SPLITTER

James L. Wirsbinski, Marshfield, Wis., assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 380,687, May 21, 1982, abandoned. This application Apr. 18, 1983, Ser. No. 485,964
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 A **32 Claims**

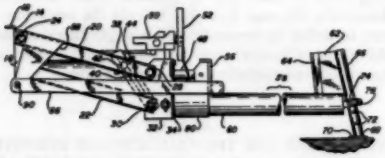
1. A hydraulic wood splitter adapted to be connected to a tractor, or the like, comprising:

front mounting means for effecting a fixed connection to said tractor;

an elongated wood supporting frame connected to said front mounting means;

means for mounting said wood supporting frame for movement between an extended position and a retracted position with respect to said front mounting means;

means on said frame for splitting wood including hydraulic ram means mounted on said wood supporting frame and movable therealong in the extended position of said frame;



height adjustment means operatively associated with said front mounting means for permitting vertical movement of said wood supporting frame and said ram;

locking means for releasably locking said wood supporting frame at any desired elevation; and

elevator means associated with said height adjustment means and selectively movable into operative association with said ram means whereby movement of said ram means effects raising or lowering of said wood supporting frame.

4,432,403

PROCEDURE AND APPARATUS FOR BARKING TIMBER

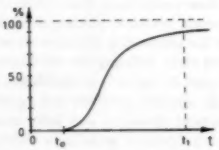
Urho Heikkinen, Helsinki, Finland, assignor to Kone Oy, Helsinki, Finland

Continuation of Ser. No. 44,777, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 864,226, Sep. 26, 1975, abandoned, which is a continuation of Ser. No. 617,056, Sep. 26, 1975, abandoned. This application May 21, 1981, Ser. No. 266,104

Claims priority, application Finland, Sep. 27, 1974, 2833/74

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—342 **17 Claims**



2. A method for barking timber wherein the timber is pretreated prior to frictional drum barking to render the drum barking more efficient, comprising:

(a) pretreating the timber by first partly removing the bark therefrom in spots and patches so as to produce bare spots and patches on the timber and provide an extended demarcation line for the bare patches between the barked and unbarked timber; and

(b) feeding the pretreated partially barked timber having bare patches into a rotating barking drum and removing the remaining bark therefrom by frictional barking for final efficient barking of the timber.

4,432,404

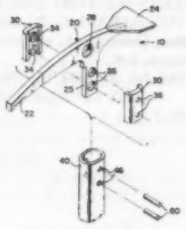
ICE AXE

James R. Clark, Kirkland, and Michael K. Reeves, Redmond, both of Wash., assignors to Seattle Manufacturing Corporation, Bellevue, Wash.

Filed Apr. 2, 1982, Ser. No. 364,983

Int. Cl.³ B26B *23/00*

U.S. Cl. 145—2 R **6 Claims**



1. An ice axe which comprises:

a head having an upper portion including a tool, and a shank depending from the upper portion, the shank including an aperture extending therethrough;

a nonmetallic spacer which surrounds the shank and abuts the exterior surfaces of the shank and shank aperture, the interior surfaces of the spacer being shaped to conform to the exterior surfaces of the shank and shank aperture, the spacer forming an elongated passageway which extends through the spacer and shank aperture;

a handle having a hollow upper portion which surrounds the shank and spacer, the interior surfaces of the hollow upper portion being shaped to conform to the exterior surfaces of the spacer assembly such that the interior surfaces of the handle abut the exterior surfaces of the spacer, the handle having handle apertures aligned with each end of the spacer passageway; and

a pin extending through the spacer passageway and handle apertures and being secured to the handle at each handle aperture, such that, in the event of failure of the spacer, the pin will engage the shank at the shank aperture to form a direct connection between the head and handle.

4,432,405

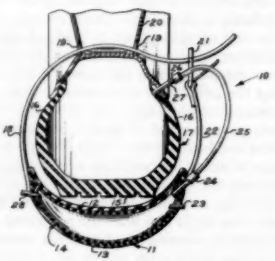
PRESSURE CUFF TIRE PUMP DEVICE

Harold Grushkin, 25 Atlantic Ave., Nanuet, N.Y. 10954

Filed Sep. 27, 1982, Ser. No. 424,395

Int. Cl.³ B60C *23/10, 29/00*

U.S. Cl. 152—424 **5 Claims**



1. A pressure cuff tire pump device, comprising, a resilient flexible casing, an inflatable bladder received in said casing, for receiving air at atmospheric pressure and discharging it under pressure into a vehicle tire, a pair of straps secured to said

casing, for fastening said casing to a vehicle wheel and its tire, a flexible hose secured to said bladder, for air transfer into said tire, and three valves secured in said bladder, for controlling the air entering and being discharged from said bladder.

4,432,406

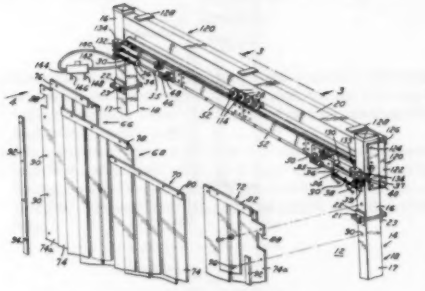
POWER OPERATED BI-FOLD STRIP CURTAIN DOOR ASSEMBLY

James A. Belanger, Northville; Robert J. Wentworth, Ann Arbor; Douglas J. Calvin, Farmington Hills, and James M. Lapham, Northville, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Continuation-in-part of Ser. No. 212,372, Dec. 3, 1980. This application May 6, 1981, Ser. No. 260,952

Int. Cl.³ E05D *15/26*

U.S. Cl. 160—199 **7 Claims**



1. A strip curtain bi-fold door assembly adapted for use in a door space defined by an overhead track, a floor and a pair of spaced apart uprights, said door assembly comprising:

at least a pair of laterally positioned inboard and outboard door means having opposed adjacent ends and free ends for closing at least a part of the door space, each said door means including support means for suspending a group of elongated flexible strip curtains in overlapping relation;

first hinge means for connecting the opposed adjacent ends of said door means;

second hinge means adapted to connect the free end of the outboard door means to one of the uprights;

carriage means adapted to guidingly engage the track for travel therealong;

said carriage means including a pivot pin means adapted for suspending the inboard door means adjacent its free end for pivotal movement during travel of said carriage means;

fluid actuator means adapted to be interconnected between one of said door means and said one upright and effective when actuated to move said door means and their associated group of strip curtains between a folded position adjacent said one upright and an extended side-by-side position across the door space;

said fluid actuator means being in the form of a piston and cylinder having one end pivotally connected to said one upright and an extensible and retractable piston rod extending from said cylinder other end with the rod pivotally connected to said outboard door means;

said carriage means further including a first roller having an annular groove which conforms to and receives said track, said roller having a stub shaft rotatably supporting said pivot pin means;

one of said door means having a terminal exterior strip curtain vertical border portion extending laterally a predetermined distance beyond the associated opposed adjacent end of said one door means;

means reinforcing the upper horizontal edge of said terminal exterior strip curtain such that its border portion is maintained in the plane of the associated group of strip curtains carried by said one door means;

wherein upon said door means being extended said terminal exterior strip curtain border portion overlapping the next adjacent strip curtain of the other door means such that a lap seal is provided at the juncture of said outboard and inboard groups of curtain strips;

said door means in their folded position having a V-shaped configuration with first interior surfaces of said door means facing inwardly in opposed relation, and second exterior surfaces of said door means facing outwardly;

the axis of said actuator being disposed substantially parallel to said outboard door means when said door means are in either said folded position of said extended position; and

a shock absorber being connected between said outboard door means and said one upright to dampen the vibrations upon the folding or opening of said inboard and outboard door means and their associated groups of strip curtains.

4,432,407

ARRANGEMENT AT A SUPPORTING AND GUIDING STRUCTURE TO BE USED IN A CONTINUOUS CASTING PLANT

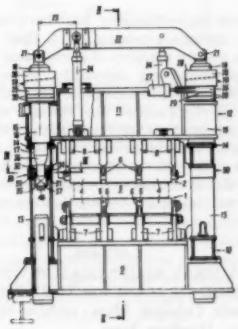
Werner Scheurecker, and Herbert Spanner, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 205,468, Nov. 10, 1980, abandoned. This application Jul. 6, 1983, Ser. No. 511,442

Claims priority, application Austria, Nov. 28, 1979, 7523/79

Int. Cl.³ B22D *11/12*

U.S. Cl. 164—448 **6 Claims**



1. In an arrangement at a supporting and guiding structure to be used in a continuous casting plant for casting a strand, in particular a continuous casting plant for casting steel slabs, and of the type including oppositely arranged roller ways for supporting the strand on two opposite sides thereof, a first supporting framework and a second supporting framework for accommodating said roller ways, and drawing anchors for bracing said second supporting framework relative to said first supporting framework, said second supporting framework being connectable with, and detachable from, said first supporting framework, the improvement which is characterized in that a bayonet connection is provided as connecting means for connecting each of said drawing anchors with one of said first and said second supporting framework, said bayonet connection including a disc, arranged in a cavity provided in one of said first and said second supporting frameworks, and having at least one recess defined therein, each one of said drawing anchors comprises a drawing-anchor head with a lateral neck corresponding to said at least one recess, said drawing-anchor head being insertable into said at least one recess, and said drawing-anchor head is rotatable between a fastening position axially fixing the pertaining one of said drawing anchors, and a

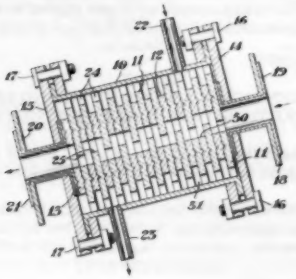
releasing position whereby said drawing anchor can be withdrawn from one of said first and said second supporting frameworks, thereby enabling the other of said first and said second supporting frameworks to be detached from said one framework.

4,432,408

METHOD AND COMPRESSED VERMICULAR EXPANDED GRAPHITE APPARATUS FOR HEAT EXCHANGING

Ronald S. Caines, Stone Mountain, Ga., assignor to The Dow Chemical Co., Midland, Mich.

Filed Jul. 19, 1982, Ser. No. 399,386
Int. Cl.³ F28D *9/00*; F28F *3/08*
U.S. Cl. 165—1 **12 Claims**



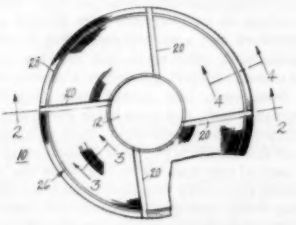
1. A method for exchanging heat between two or more fluids, which comprises passing a first fluid through a core member made up of a plurality of plates made by compressing a composition containing essentially vermicular expanded graphite substantially more along one axis than along the other two axes, and passing a second fluid through said core member in separate but heat exchange relationship with said first fluid in such a manner that the primary exchange of heat between the two fluids is through the core member along an axis of the core member that is normal to the axis of substantial compression under which said core member is formed.

4,432,409

ROTARY HEAT REGENERATOR WHEEL AND METHOD OF MANUFACTURE THEREOF

Donald F. Steele, Cohasset, Mass., assignor to Northern Solar Systems, Inc., Hingham, Mass.

Filed Nov. 3, 1981, Ser. No. 317,756
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—8 **9 Claims**



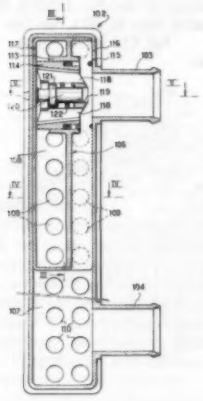
1. A rotary heat recovery device, comprising a heat recovery wheel formed of spiral wound layers of at least one strip of synthetic plastic material and spacing means between the layers forming gas passages therebetween, in which the wheel has reinforcing means provided by narrow portions extending radially in which the layers of the strip have been adhered together.

4,432,410

HEAT EXCHANGER, IN PARTICULAR FOR A COOLING CIRCUIT OF A MOTOR VEHICLE ENGINE

Patrick Cadars, Montigny le Bretonneux, France, assignor to Valeo, Paris, France

Filed May 5, 1981, Ser. No. 260,672
Claims priority, application France, May 5, 1980, 80 09989
Int. Cl.³ B05D *23/00*
U.S. Cl. 165—32 **8 Claims**



1. A heat exchanger, particularly for a cooling circuit of a motor vehicle engine, comprising a water box provided with at least a liquid inlet pipe; a nest of tubes opening into the water box; first and second chambers formed inside the water box; first and second liquid circuits formed in parallel in the exchanger, the first circuit comprising said first chamber and at least a portion of said tubes, the second circuit comprising at least said second chamber; passages formed between said liquid inlet pipe, said first chamber and said second chamber and comprising a tubular cylindrical wall forming a bearing open at both ends thereof and extending between said chambers; a valve sensitive to the liquid temperature for controlling the flow of the liquid through said passages and said circuits, a cylindrical valve member guided in said bearing and biased in one direction by said temperature sensitive valve; a return spring for biasing said cylindrical valve member in a direction opposite to said one direction; said temperature sensitive valve, said valve member and said bearing being in axial alignment with said liquid inlet pipe inside said water box, said valve member having an axial inner sleeve and a cylindrical skirt open at both ends thereof and guided in said bearing, said temperature sensitive valve having a body received in said sleeve and a piston applied on a wall of said water box opposite to said liquid inlet pipe, said return spring being provided between said valve member and a wall of said water box.

4,432,411

RADIANT HEAT SHIELD FOR A SUPERCONDUCTING GENERATOR

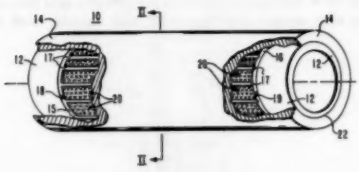
George D. Hooper, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 3, 1982, Ser. No. 354,488
Int. Cl.³ F24H *3/00*
U.S. Cl. 165—47 **9 Claims**

1. A superconducting rotor, comprising:

a first tube having two circumferential grooves formed in its outer cylindrical surface, said two circumferential

grooves being a preselected axial distance apart, said first tube having a plurality of axial grooves formed in its outer cylindrical surface, each of said axial grooves intersecting said two circumferential grooves and providing fluid communication therebetween, each of said circumferential grooves having a hole intersecting it and extending radially inward to intersect the inside cylindrical surface of said first tube;



a second tube disposed radially outward from said first tube in coaxial and concentric relation, said second tube providing a radially outer fluid seal for said circumferential and axial grooves; and

a thin cylindrical layer of brazing material disposed between said first and second tubes, said layer of brazing material having an axial length which is less than the axial length of said first tube and less than the axial length of said second tube.

4,432,412

COOLING DEVICE

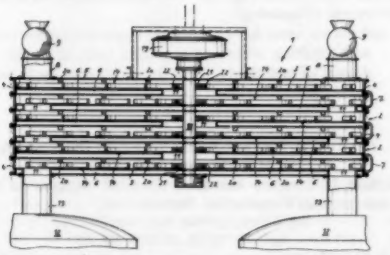
Lothar Teske, Hegelstr. 15, 5000 Koln 90, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,500

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031851

Int. Cl.³ F28F *13/12*

U.S. Cl. 165—93 **3 Claims**



1. A cooling device for cooling coal dust or other fine particulate material both from its bottom and its top comprising a housing having a plurality of vertically arranged and secured housing sections of which the uppermost housing section is covered, a motor-driven conveyor device mounted in said housing to transport the coal dust or particulate material from one or more inlets to one or more outlets over the coolable bottom of the housing, the housing having a circular cross-section and a plurality of coolable tray members spaced one above another disposed in the housing, said tray members each being provided with cooling means arranged on their bottom sides and each tray member having associated therewith a conveyor wheel arranged to move over it, the wheels being connected to a common motor-rotatable shaft arranged vertically and coaxially with respect to the housing, each tray member having at least one outlet arranged alternately at the center of the tray member and adjacent an outer housing shell and the conveyor wheels being shaped to convey material from an inlet in the cover of the housing and/or from an outlet in the uppermost tray to an outlet of the lowermost tray, each tray member in each housing section being provided on its bottom side with a chamber traversable by cooling agents and which communicate with each other by pipelines.

4,432,413

HEAT ABSORBER

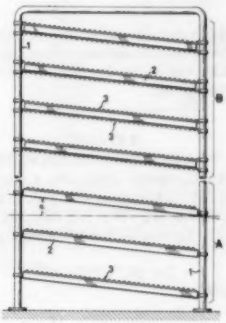
Holger Brass, Waldbrunn; Herbert Braunisch, Hofheim am Taunis; Dieter Disselbeck, Bad Soden am Taunus, and Helmut Golly, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst AG., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,070

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040510

Int. Cl.³ F28F *13/18*; F24J *3/02*

U.S. Cl. 165—133 **11 Claims**



1. An ambient-air heat absorber comprising a plurality of flat plate-type heat exchanger elements each having an upper surface and a lower surface, between which upper and lower surfaces flows a heat transfer medium; a frame supporting said heat exchanger elements generally horizontally and one above the other with a predetermined spacing therebetween, while permitting natural flow of ambient air across said heat exchanger elements; and a plurality of lattice grids each formed of plastics and arranged on at least one of the upper and lower surfaces of a respective one of said heat exchanger elements to disrupt laminar flow of said ambient air across the respective surface of the associated heat exchanger element.

4,432,414

DUAL CIRCUIT EMBOSSED SHEET HEAT TRANSFER PANEL

Grover D. Morgan, St. Louis County, Mo., assignor to The United States of America are represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 23, 1982, Ser. No. 410,680

Int. Cl.³ F28F *3/12*

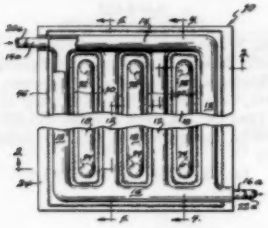
U.S. Cl. 165—140 **9 Claims**

1. A heat transfer panel having first and second independent cooling circuits for cooling a common surface, each cooling circuit consisting of a plurality of channels communicating with an inlet and an outlet header, said panel comprising:

a first sheet embossed to form first portions of the channels of said first and said second cooling circuits, and first portions of the inlet and outlet headers of the first cooling circuit;

a second sheet having first and second sides, said first side dimensioned to completely overlie said first sheet and joined to said first sheet to form channels and inlet and outlet headers of said first cooling circuit and channels of said second cooling circuit, said second sheet further having inlet and outlet apertures communicating with the channels of the second circuit; and

third and fourth sheets dimensioned to overlie said inlet and outlet apertures of said second sheet, respectively, said third and said fourth sheets embosed to form first portions



of said inlet and said outlet headers are joined to said second side of said second sheet at spaced-apart locations to form inlet and outlet headers of said second cooling circuit, respectively.

4,432,415

PLATE HEAT EXCHANGER

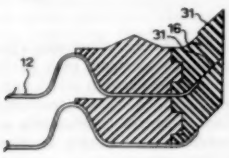
Felix W. Wright, Copthorne Bank, Nr. Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed Jan. 22, 1982, Ser. No. 341,749

Claims priority, application United Kingdom, Jan. 30, 1981, 8102899

Int. Cl.³ F28F *3/10*

U.S. Cl. 165—166 **13 Claims**



1. A plate for a plate heat exchanger, the said plate comprising a flow space zone and a two part gasket to seal a flow space zone, a first part of the gasket being of comparatively hard elastomeric material and substantially permanently attached to the plate, and a second part of the gasket being of comparatively soft elastomeric material so as to be compressible to form a seal, the said second part being located on a side of the said first part nearer the flow space zone to be sealed, said first and second parts having co-operating structures in operative contact such that said second part is mechanically retained by said first part, whereby the first part provides external lateral reinforcement of the second part against the pressure in the flow space zone, the second part is secured to the plate by means of the first part and is not directly attached to the plate, and said second part is mechanically retained by said first part in a manner allowing convenient removal of said second part for replacement.

4,432,416

WELL FLOW CONTROL APPARATUS

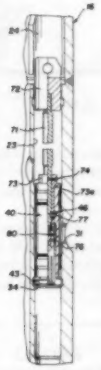
William R. Welch; Ernest P. Fisher, and John H. Yonker, all of Carrollton, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 23, 1982, Ser. No. 351,547

Int. Cl.³ E21B *23/02, 43/12*

U.S. Cl. 166—117.5 **20 Claims**

1. In a well device for controlling flow between the exterior and interior of a well flow conductor which includes: a side pocket mandrel having a longitudinal main bore and having a longitudinal receptacle bore in said side pocket opening to said main bore, said mandrel being connectible in said well flow conductor with its main bore in axial alignment therewith; said receptacle bore having lateral port means through the wall thereof to the exterior of said mandrel, and annular seal surface means at opposite sides of said lateral port means engageable with a flow control device; a first flow control device comprising a sleeve valve disposed for reciprocation in said receptacle bore between port-closing and port-opening positions for controlling flow through said lateral port means, said sleeve valve having seal means coacting with said annular seal surface



means of said receptacle bore; said receptacle bore and said sleeve valve having coacting latching means for retaining said sleeve valve in the port-closing position; said sleeve valve being movable to port-opening position and returned to port-closing position in response to the insertion and removal of a second flow control device in said receptacle bore; the improvement comprising

said sleeve valve having latching recess means for coaction with latching means of a pulling tool, to enable withdrawal of said sleeve valve from said receptacle bore.

4,432,417

CONTROL PRESSURE ACTUATED DOWNHOLE HANGER APPARATUS

Michael L. Bowyer, Aberdeen, Scotland, assignor to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 307,903

Int. Cl.³ E21B *33/129, 34/10*

U.S. Cl. 166—120 **14 Claims**

1. In an apparatus for use in a subterranean well comprising a hanger for supporting an interior conduit such as a tubing string extending therebelow, said hanger being anchorable against an exterior conduit, upon radial expansion of anchoring slip elements in response to fluid pressure in a pressure chamber communicating through a hanger port extending to the interior bore of said hanger, with fluid pressure acting upon a hydraulically activated hanger slip setting piston and an annulus safety valve for controlling fluid flow in the annulus between said interior and exterior conduits in response to fluid pressure in a separate control line, the improvement comprising control line communication means for activating said hydraulically activated hanger slip setting piston and said safety valve by means of fluid pressure in the same control line, said control line communication means comprising:

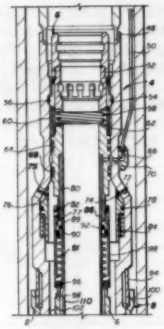
landing nipple means for engaging said hanger and the interior conduit extending above said hanger,

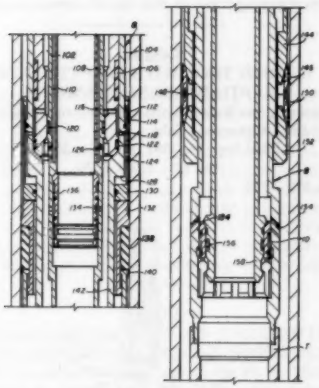
a first radially extending port in said landing nipple means communicable with said control line and said annulus safety valve;

a second radially extending port in said landing nipple means communicable with said hanger port;

disengageable means for suspending said annulus safety valve from said landing nipple means; and

separation sleeve means suspendable from said landing nipple means instead of said annulus safety valve for establishing fluid communication between said first and second radially extending ports to expose said hydraulically activated hanger slip setting piston to fluid pressure in said separate control line to set said hanger prior to installation of said annulus safety valve.





4,432,418

APPARATUS FOR RELEASABLY BRIDGING A WELL

Harold E. Mayland, 2467 S. Granby Way, Aurora, Colo. 80014

Filed Nov. 9, 1981, Ser. No. 319,440

Int. Cl.³ E21B *33/128, 33/129*

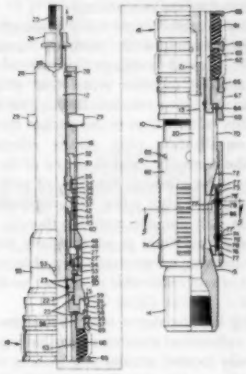
U.S. Cl. 166—133 **20 Claims**

10. In a retrievable bridge plug having an expandible packer assembly adapted to be expanded into anchored relation to a well conduit, the improvement comprising:

an inner mandrel extending substantially the length of said plug, said mandrel having a section with no passageway therethrough;

a support tube disposed in outer concentric relation to said inner mandrel including means releasably interconnecting said inner mandrel and said tube; and

pressure equalizing means including a passageway establishing communication above and below said packer assembly with said well conduit and including a normally closed port in said support tube, said port being movable to a position opening said passageway when an upwardly directed force is applied to said outer tube and said packer assembly is in the expanded position in said well conduit whereby to equalize the pressure above and below said packer assembly, said normally closed port disposed in said support tube above said packer and defined by an axially separable portion in said support tube which is operative to undergo separation to open said port when an upwardly directed force is applied to said support tube.



4,432,419

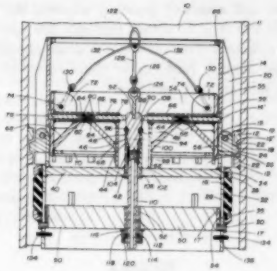
RETRIEVABLE PLUG

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 6, 1980, Ser. No. 194,194

Int. Cl.³ E21B *33/02;* **E02B** *5/00*

U.S. Cl. 166—188 **6 Claims**



1. A removable plug for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means adapted to be disposed within said annular member, the plug body means comprising:

packer mandrel means having a plurality of apertures therein, having an annular recess in the interior thereof and having a circular packer mandrel plug therein for preventing the flow of said fluid therethrough, the circular packer mandrel plug having a centrally located sleeve therein;

packer member means located on the packer mandrel means for sealingly engaging the interior of said annular member;

packer setting sleeve means located on the packer mandrel means for compressing the packer member means into

sealing engagement with the interior of said annular member;

locking dog means pivotally mounted on the packer mandrel means for retaining said removable plug from axial movement when installed in said annular member, the locking dog means comprising:

a plurality of members pivotally mounted on the packer mandrel means, each member having a portion thereof adapted to engage a portion of the interior of said annular member when said plug is installed therein and being rotatable through an aperture of the plurality of apertures in the packer mandrel means;

pressure equalization plug means releasably secured within the centrally located sleeve of the packer mandrel means for allowing the flow of said fluid through said removable plug when said removable plug is installed in said annular member thereby allowing the pressure of said fluid to substantially equalize in said annular member across said removable plug before the removal of said removable plug from said annular member; and

annular dog locking sleeve assembly means comprising:

annular cylindrical member means having an elongated, centrally located annular dog locking sleeve mandrel means located therein, having reinforcing ring means located on the interior surface of the end portion of the annular cylindrical member means which has a portion of the exterior surface thereof abutting the dog locking means, and having a plurality of pin sleeve means secured to the annular cylindrical member means and the elongated annular dog locking sleeve mandrel means,

the annular dog locking sleeve assembly means being slidable within the packer mandrel means between a first position wherein the locking dog means abut a portion of the exterior surface of the annular cylindrical member means of the dog locking sleeve assembly means thereby preventing rotation of the locking dog means through the apertures in the packer mandrel means and a second position wherein the locking dog means are free to rotate through the apertures in the packer mandrel means thereby disengaging the interior of said annular member to allow removal of said plug from said annular member.

4,432,420

RISER TENSIONER SAFETY SYSTEM

Edward W. Gregory, Calgary, Canada, and Gregory G. Baer, Newton, N.C., assignors to Exxon Production Research Co., Houston, Tex.

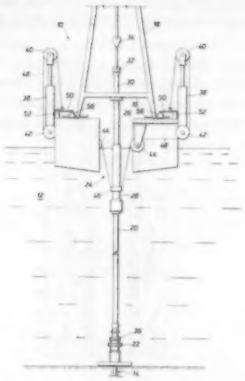
Filed Aug. 6, 1981, Ser. No. 290,553
Int. Cl.³ E21B *34/04*
U.S. Cl. 166—355 **17 Claims**

1. A tensioner system for tensioning a marine riser extending between a floating vessel and a wellhead at the bottom of a body of water, said tensioner system comprising:

at least one flexible tensioning line having a first end attached to the top of said riser and a second end attached to a stationary anchor point on said vessel;

tensioning means attached to said vessel, said tensioning means being in contact with and capable of applying force to said flexible tensioning line; and

safety means attached to said flexible tensioning line and adapted to deactivate said tensioning means if the tension in said flexible tensioning line drops below a predetermined level, thereby preventing said tensioning means from applying force to said flexible tensioning line.

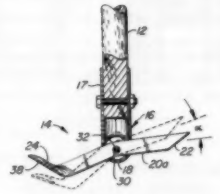


4,432,421

GARDEN TOOL WITH SELF-CLEANING EARTH-WORKING ELEMENTS

Elof Granberg, San Rafael, Calif., assignor to Granberg Pump & Meter Ltd., Richmond, Calif.

Filed Sep. 16, 1981, Ser. No. 302,935
Int. Cl.³ A01B *1/20*
U.S. Cl. 172—375 **3 Claims**



1. A garden tool for raking and thatching surface materials and cutting weeds and cultivating below the surface of the soil, said tool comprising:

an elongate handle;

a tubular cross member secured perpendicular to one end of the handle, said cross member having a plurality of aligned paired slots disposed along the length of the member, the slots of each pair being coplanar and spaced 180° apart;

a rod centered within the tubular cross member; and

a plurality of earth-working elements rotatably attached to the rod and independently rotatable with respect to said rod, each of the elements passing through a pair of the slots in the cross member which are so dimensioned as to permit but limit the rotation of the respective one of the elements with respect to the other of the elements, rotation of the elements being otherwise unconstrained, each of the elements including a pointed tine at one end and a laterally inclined blade at the other, the blades of adjacent elements being substantially contiguous, the tined ends of the elements being used for raking and thatching with the limited rotation permitted for the elements being of a sufficiently significant angle as to provide self-cleaning of the elements on the backstroke by permitting the elements to briefly move apart from each other, the blades being

used for subsurface weeding and cultivation with the limited rotation allowing large weed stalks to slip between the blades and cleaning the blades when the direction of motion is reversed.

4,432,422

BOREHOLE GUIDE AND METHOD OF BORING INTERPENETRATING HOLES

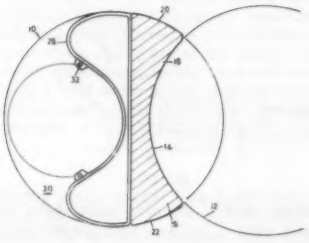
Robert J. Hopley, Germiston, and Wynand J. van der Westhuizen, Boksburg, both of South Africa, assignors to Boart International, Limited, Transvaal, South Africa

Filed Jul. 14, 1981, Ser. No. 283,276

Claims priority, application South Africa, Jul. 17, 1980, 80/4310; Sep. 9, 1980, 80/5549; Nov. 10, 1980, 80/6920

Int. Cl.³ E21B 7/08

U.S. Cl. 175—61 18 Claims



1. A method of boring interpenetrating non-parallel holes which includes the steps of boring a first hole, locating at least two guides in the first hole with one of the guides being angularly displaced relative to the other guide to form an inclined path that can be varied in degree of inclination, securing each guide in position by displacing each guide into contact with a wall of the first hole such that substantially an entire surface of the guide travels approximately the same distance to contact the wall, and directing a drill into guiding engagement with the guides to bore a second hole overlapping the first hole.

4,432,423

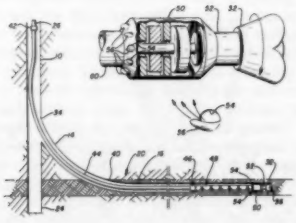
APPARATUS FOR EXTENDED STRAIGHT LINE DRILLING FROM A CURVED BOREHOLE

William C. Lyons, 1209 Calle Luna, Santa Fe, N. Mex. 87501, and Albert O. White, 1327 Fox Hollow Rd., Schenectady, N.Y. 12309

Division of Ser. No. 108,686, Dec. 31, 1979, Pat. No. 4,333,539. This application Mar. 22, 1982, Ser. No. 360,585

Int. Cl.³ E21B 4/02, 7/08

U.S. Cl. 175—75 6 Claims



1. Drilling apparatus comprising a flexible pipe, a straight drill guide, a fluid turbine, a drill bit;

a drill pipe string connected to one end of said flexible pipe; said straight drill guide having opposed ends with one end thereof being connected to the other end of said flexible pipe and the other said opposed end of said straight drill guide being connected to said fluid turbine; means connecting said drill bit for rotation by said fluid turbine;

passageway means formed along the longitudinal central axis of said drill pipe string, said flexible pipe, and said straight drill guide by which a source of power fluid is conducted to said fluid turbine; said turbine includes exhaust ports which are directed away from the turbine in a direction to provide a reaction which induces a turning moment in opposition to the drilling reaction of the bit; so that after a vertical borehole has been formed, and thereafter turned laterally from the vertical part of the borehole; said turbine continues to advance said bit along a substantially horizontal path.

4,432,424

LIFT LOADER

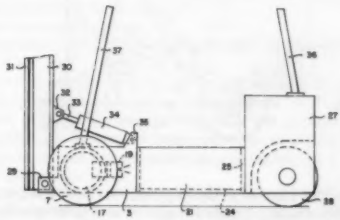
Theodor Abels, Aschaffenburg, and Güter Honecker, Seligenstadt, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,964

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3117078

Int. Cl.³ B62D 11/04

U.S. Cl. 180—6.48 13 Claims



1. A lift loader such as a fork lift comprising two side and one rear frame elements, a pair of drive wheels on said frame elements, a pair of drive motors, a transmission housing with a gearing arrangement drivingly connecting each said motor to a drive wheel whereby each of said motors drives one of said drive wheels, each of said transmission housings being joined to the frame and being flanged onto one end of its corresponding motor at one side and supporting a wheel hub on the other side, said frame being provided with a rear cross bar and at least two lateral struts, each of said transmission housings being connected to one of said struts to form an extension thereof, said drive motors having drive shaft axes parallel to each other and being connected together at their ends opposite the transmission housings in a rigid bending resistant manner to form a front frame element.

4,432,425

WHEEL CHAIR

Leonard R. Nitzberg, 1413 Buckeye La., Knoxville, Tenn. 37919

Filed Nov. 5, 1981, Ser. No. 318,631

Int. Cl.³ B62D 57/02

U.S. Cl. 180—8 A 15 Claims

1. Appratus for moving an object over substantially varying terrain, including stairs having stair treads, which comprises:

a frame for supporting said object, said frame having opposite sides and a front portion and a rear portion;

first wheel means mounted from said front portion of said frame having a front wheel proximate each side of said frame for engagement with said terrain;

second wheel means mounted from said rear portion of said frame having a rear wheel proximate each side of said frame for engagement with said terrain;

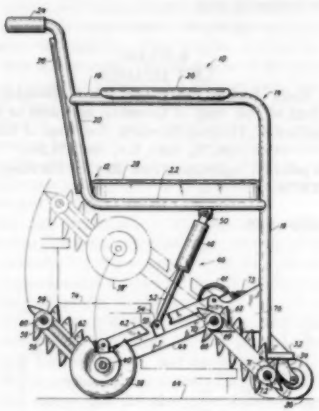
drive means connected to at least one of said first and said

second wheel means for rotating corresponding of said wheels against said terrain;

first level sensing means carried by said frame for continuously sensing any change in pitch of said frame from a pre-set pitch value;

means responsive to said first level sensing means connected between said frame and at least one of said first and second wheel means for correcting said pitch to said pre-set pitch value; and

a stair engaging means associated with each of said front wheels and said rear wheels for causing said apparatus to ascend or descend said stairs, said stair engaging means



including an oval-shaped carrier unit having a peripheral flexible endless member mounted in a substantially vertical plane with the long dimension of the oval oriented at an angle from horizontal substantially equal to an average stair pitch and with one end of said oval carrier being proximate corresponding of said wheels, means connected to said endless member for rotating said endless member about said carrier, and deployable lugs extending from said endless number in said vertical plane for engagement with treads of said stairs, said lugs being moved from a retracted position to a deployed position upon contact of a portion of said lugs with said treads.

4,432,426

STAIR CLIMBING WHEELCHAIR CARRIER

Rintaro Misawa, Tokyo, Japan, assignor to Sunwa Sharyo Manufacturing Company Limited, Tokyo, Japan

Filed Apr. 20, 1981, Ser. No. 255,927

Claims priority, application Japan, Nov. 29, 1980, 55-168542

Int. Cl.³ B62B *5/02*

U.S. Cl. 180—8 A **7 Claims**

1. A stair climbing wheelchair carrier comprising:

a carrier portion including a frame,

a pair of endless belt crawlers on said frame,

a plurality of pairs of wheels rotatably supported on said frame for guiding said endless belt crawlers and a driving motor for driving one of said pairs of wheels,

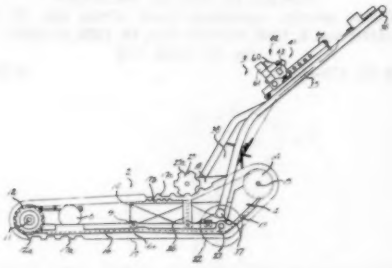
each of said endless belt crawlers having a predetermined span in a longitudinal direction extending over a predetermined extent of two steps in a staircase and an oblique overhang portion at one end of said frame which has a first predetermined height higher than the usual height of a step in a staircase,

a handle portion rotatably and detachably attached to said carrier portion at a portion adjacent to said oblique overhang portion so as to be rotated in the longitudinal direction of said carrier,

said handle portion being adapted to be rotated between an operating inclined position with respect to said carrier portion and a wheelchair engaging upright position with respect to said carrier portion,

means for securing said handle portion to said frame at said operating inclined position,

a pair of idlers mounted adjacent to said oblique overhang portion and depressingly engaging said endless belt crawlers at upper moving portions thereof adjacent to said oblique overhang portion so as to decrease the height of the upper moving portions so that substantially most of



said carrier portion including substantially up to said overhang portion has a second predetermined height lower than the top of a central free space beneath a wheelchair permitting the wheelchair to approach said handle portion,

a wheelchair holding means provided on said handle portion for holding the wheelchair when said handle portion is at said wheelchair engaging upright position, whereby said wheelchair is set in the inclined operating position by rotating said handle portion from said wheelchair engaging position to said inclined operating position.

4,432,427

AGRICULTURAL TRACTORS AND OTHER VEHICLES

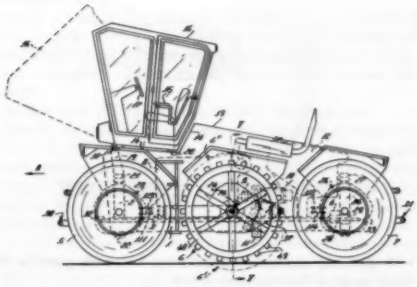
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Division of Ser. No. 4,877, Jan. 19, 1979, Pat. No. 4,311,203, which is a continuation of Ser. No. 816,254, Jul. 15, 1977, abandoned, which is a division of Ser. No. 588,156, Jun. 19, 1975, abandoned. This application Jan. 11, 1982, Ser. No. 338,629

Claims priority, application Netherlands, Jun. 25, 1974, 7408500

Int. Cl.³ B62D *61/10*

U.S. Cl. 180—24 **16 Claims**



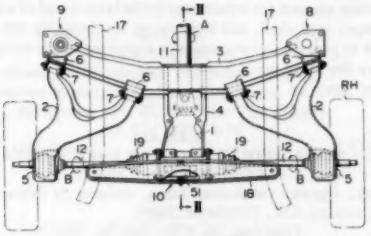
1. A tractor which comprises: a frame, power producing means supported by said frame; at least three pairs of ground

wheels of substantially the same diameter mounted on said frame whereby one pair of said wheels are located forwardly thereon, a further pair of said wheels are located rearwardly thereon and a central pair of said wheels are located between said forward and said rear pairs of wheels, said frame including a first portion which is rigid and mounts for rotation said forward pair of wheels and said central pair of wheels so that their individual axes of rotation are substantially retained in a generally horizontal plane, said frame including a second portion which is substantially turnable freely within limits about a horizontal fore and aft axis relative to said first frame portion, said rear wheels being mounted on said second frame portion, each said pair of wheels including separate means for rotating same; power transmission means connecting each said rotating means with said power producing means so constructed and arranged that each said pair of wheels is energized independently of the other said pairs of wheels; steering means connected to the forward of said pairs of wheels whereby said forward wheels are steerable with respect to said rear pair of wheels; connecting means connected to at least the rear of said frame for connecting implements to the tractor; said central wheels located between said forward and said rear pairs of wheels having a tread width greater than the tread width of said forward and rear wheels and having a dentated form as seen from the side.

4,432,428
MOUNTING MECHANISM FOR A DIFFERENTIAL GEAR ASSEMBLY OF AN AUTOMOBILE

Toshiro Kondo, and Kiyohiko Hamaoka, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 26, 1982, Ser. No. 352,572
Claims priority, application Japan, Feb. 28, 1981, 56-29010
Int. Cl.³ B60K *17/16*
U.S. Cl. 180—73 D **5 Claims**

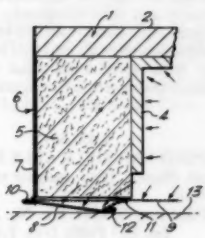


1. A differential gear mounting structure for an automobile comprising a body, a sub-frame extending substantially transversely with respect to said body and having an intermediate portion and opposite end portions, said mounting structure including means for mounting differential gear means on said sub-frame at the intermediate portion thereof, said differential gear means being connected with a propeller shaft and a pair of sidewardly extending driving axles so that a driving torque of the propeller shaft is transmitted through the differential gear means to said driving axles to produce driving torque for driving wheels which are respectively connected with said driving axles, suspension arms pivotably connected at one end portion with said sub-frame respectively at the opposite end portions of said sub-frame and at the other end portion with said wheels, a pair of mounts for connecting the respective end portions of the sub-frame to said body so that reaction forces against the driving torques in said propeller shaft and in said driving axles are produced at the mounts, one of said mounts which is on the end portion of the sub-frame wherein said reaction force is greater than in the other end portion comprising fluid type damping means which has ability of absorbing relative vertical movement between said body and said sub-frame, the other mount including resilient support means.

4,432,429
AIR-CUSHION APPARATUS

Harold J. Clements, Canterbury, England, assignor to Modern Precision Engineers and Associates Limited, Ashford, England

Filed Jul. 28, 1981, Ser. No. 287,558
Claims priority, application United Kingdom, Jul. 30, 1980, 8024948; Nov. 28, 1980, 8038187
Int. Cl.³ B60V *1/02*
U.S. Cl. 180—127 **16 Claims**



1. An air-cushion supported, manually maneuverable, load-carrying apparatus comprising:

a load-carrying base;

a dependent perimetric shirt for laterally confining pressurized air; and

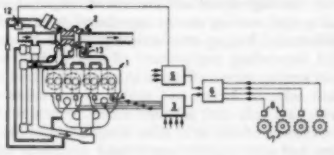
means for restraining a foot portion of said skirt to a permanently inwardly extending configuration for urging said skirt into sealing engagement with the ground by the internal air pressure during operation, said foot portion having at least one ground-engaging sealing fin extending all around the skirt;

wherein said skirt restraining means is secured to the skirt at spaced inner and outer regions, spanning said foot portion, said skirt restraining means having rectilinear spacing being substantially less than the corresponding width of the foot portion for providing the foot portion with freedom to seal with the ground, said skirt including means for urging the foot portion into substantially continuous sealing engagement with an irregular ground surface when the skirt is not pressurized.

4,432,430
WHEEL SPINNING CONTROL SYSTEM FOR MOTOR VEHICLES

Lars Lind, Floda; Kent Melin, and Lars Sandberg, both of Gothenburg, all of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Jun. 29, 1982, Ser. No. 393,625
Claims priority, application Sweden, Jun. 29, 1981, 8104064
Int. Cl.³ B60K *31/00*; F02D *5/02*
U.S. Cl. 180—197 **5 Claims**



1. Control system for optimizing driven wheel traction and the capacity to take up lateral forces in a wheeled vehicle with a combustion engine which has a fuel injection system with injection valves, which comprises first speed sensor means for continuous sensing of the speed of the driven wheels of the vehicle, second speed sensor means for continuous sensing of

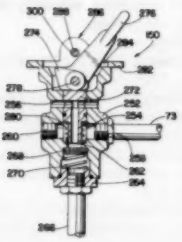
the speed of the non-driven wheels of the vehicle, and a processing unit disposed to receive and compare speed-dependent signals sent by the first and second speed sensor means and upon detecting a speed difference to send a signal to a control unit to limit the injected quantity of fuel injected through the injection valves, characterized in that the processing unit is disposed to limit the injected quantity incrementally up to a level determined by the size of the speed differential between the driven and the non-driven wheels first having a speed differential, by sensing a signal to the control unit to discontinue the injection through the respective valves one by one, first intermittently and then completely, so that a predetermined small speed differential results in intermittent discontinuation of the injection through only one injection valve, and a predetermined large speed differential results in complete discontinuation of the injection through a plurality of valves.

4,432,431

CHANGE SPEED MULTIPLE AXLE SHIFT LOCK OUT

John D. Russell, Mentor, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 7, 1981, Ser. No. 290,985
Int. Cl.³ F16H *1/44, 1/40*
U.S. Cl. 180—248 **4 Claims**



1. An improved control system for a change speed multiple drive axle assembly comprising at least two driving axles, each of said driving axles including a change speed mechanism acuatable to vary the output speed of the axle to a high speed and a low speed range, axle assembly speed shift selector means associated with each of said change speed mechanisms and operable by movement between a first and a second position to selectively actuate said change speed mechanisms to vary the output speed of the driving axles substantially simultaneously, interaxle differential means drivingly connected between said driving axles and operable to provide a differential action therebetween, an interaxle differential lockup mechanism actuatable to render said interaxle differential inoperative, and interaxle differential lockup selector means operable to selectively actuate said interaxle differential lockup mechanism, the improvement comprising:

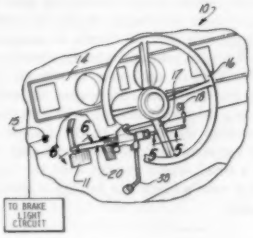
said interaxle differential lockup selector means effective to engage said interaxle differential lockup mechanism in both the high speed and low speed ranges of said driving axles and sensing means associated with said interaxle differential lockup mechanism effective to sense actual and impending engagement of said lockup mechanism, said sensing means effective to provide a signal to said axle shift selector means and shift lockout means associated with said axle shift selector means to positively prevent movement of said axle shift selector means between said first and second positions thereof whenever said sensing means signal indicates actual and impending engagement of said interaxle differential lockup mechanism, said shift selector means comprising a switch housing having a handle pivotably mounted therein, said handle pivotably movable to a first and a second position relative to said housing for operation of said axle change speed mechanisms and said shift lockout means comprising a member having a first position relative to said housing allowing pivotal movement of said handle and a second position relative to said housing for blocking pivotal movement of said handle.

4,432,432

AUTOMOTIVE ANTI-THEFT DEVICE

Neil J. Martin, 28150 Rose, Trenton, Mich. 48183

Filed Feb. 9, 1981, Ser. No. 232,541
Int. Cl.³ B60R *25/02, 25/08*
U.S. Cl. 180—287 **25 Claims**



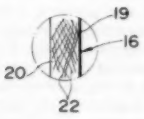
1. An automotive anti-theft device conversion kit for a standard automotive bumper jack of the type having a shaft, a jacking mechanism, a jack hook, apertures and removable lug wrench for locking the wheels of an automotive vehicle by installing the bumper jack with conversion kit between the brake pedal and steering wheel so as to depress the brake pedal of the automotive vehicle, said conversion kit comprising, a lower jack adaptor having a forked stem portion being adapted to engage the brake pedal arm of an automotive vehicle, a top portion adapted for attachment to the bottom end of a standard bumper jack shaft, and lock means for engaging the bumper jack to prevent the retraction or unjacking of the bumper jack once the brake pedal is depressed.

4,432,433

NOISE REDUCING COVER FOR INTERNAL COMBUSTION ENGINE

Naoki Ogawa, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Aug. 26, 1981, Ser. No. 296,510
Claims priority, application Japan, Sep. 3, 1980, 55-125239[U]
Int. Cl.³ F01N *1/24*
U.S. Cl. 181—204 **13 Claims**



1. A noise reducing cover for an internal combustion engine, comprising:

a first layer formed into a self supporting three dimensional shape and of a first material which is high in vibration damping capacity, said first layer having an inner surface adapted to receive heat from the engine, and an outer surface directly contacting with ambient air; and

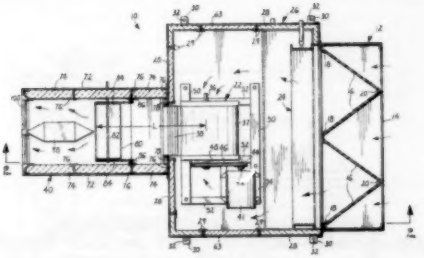
means for effectively transmitting heat from said inner surface of said first layer to said outer surface of said first layer, said heat transmitting means including metal fibers contained in said first layer of high vibration damping capacity material.

4,432,434

SOUND ABSORBING ARRANGEMENT FOR AIR HANDLING UNITS

Frank J. Dean, Jr., Jackson County, Mo., assignor to Tempmaster Corporation, Kansas City, Mo.

Filed Jan. 7, 1982, Ser. No. 337,584
Int. Cl.³ F01N *1/24*
U.S. Cl. 181—225 **7 Claims**



1. In a variable volume air handling unit having a housing, a fan in the housing presenting a plurality of forwardly curved blades turning about a fan axis to draw air into an inlet side of the fan and discharge the air from a discharge side of the fan, and a duct connected with the discharge side of the fan, the improvement comprising:

a damper mounted for opening and closing movement in said duct at a location downstream from the fan axis a distance having the dimension L; and

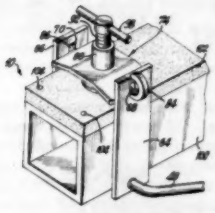
acoustical material in said duct between the fan and damper, said acoustical material having effective sound absorbing ability at a sound wave frequency f=C/4L where C represents the speed of sound.

4,432,435

CLAMPING DEVICE

Carl Anderson, 12 St. Stephens Pl., Staten Island, N.Y.

Continuation-in-part of Ser. No. 143,506, Apr. 24, 1980. This application Apr. 20, 1981, Ser. No. 255,631
Int. Cl.³ E04G *7/10*
U.S. Cl. 182—82 **8 Claims**



1. In combination, a U-shaped bracket comprising a pair of opposing side plates extending from a connecting bar, said side plates being relatively movable with respect to each other along said bar, the ends of said side plates remote from said bar being slotted, and

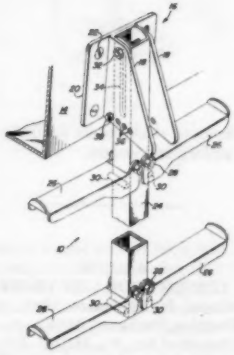
a clamping device for securing a rectangularly shaped pole within said bracket, said clamping device comprising, a plate member having a flat central section and forwardly angled side sections on either side thereof, said central section having a hole extending therethrough, a bolt having a forward end threadingly passing through said hole to extend from a forward surface thereof, a bearing plate rotatably mounted on the forward end of said bolt for abutting the pole and pressing it toward said bar, hook means laterally extending from opposing ends of said side sections of said plate member for respectively engaging the slots in said side plates, said hook means being rearwardly angled with respect to said side sections to form a V interconnection therewith, whereby continued threading of said bolt against the pole presses said pole against said connecting bar and simultaneously said V interconnections draw together said side plates to abut the sides of the pole so that the pole is securely retained on all four sides thereof.

4,432,436

ADJUSTABLE TRANSOM BRACKETS AND COMPACT SELF-STORING BOAT LADDER

Glen H. Sutter, R.R. 1, Le Claire, Iowa 52758

Filed Sep. 23, 1982, Ser. No. 422,114
Int. Cl.³ E06C *5/04*; B63B *27/14*
U.S. Cl. 182—97 **2 Claims**



1. A ladder for attachment to the transom of a small boat, comprising a bracket of general U-shape as seen from above and including a transverse substantially upright wall including means for affixation of the bracket to the transom and a pair of upright, fore-and-aft flanges spaced closely laterally apart and rigid with and extending rearwardly from the wall, a transverse pivot carried by and spanning the flanges, a ladder post having a free end portion received between the flanges and having means connecting said end portion to the pivot for swinging inversion of the post from a down position extending into the water and an up position clear of the water, said means including a track extending lengthwise of the end portion and receiving the pivot as a track follower, said track having a first stop closely adjacent to the terminal end of the post and a second stop relatively remote from said terminal end, whereby the post in its down position depends from the pivot via its first stop and in its up position slides downwardly in the track and engages the second stop so that the portion of the post between the stops engages the bracket wall below the pivot to retain the post generally upright and against rearward swinging until the post is manually lifted upwardly to engage the first stop with the pivot.

4,432,437

FIRE ESCAPE SYSTEM

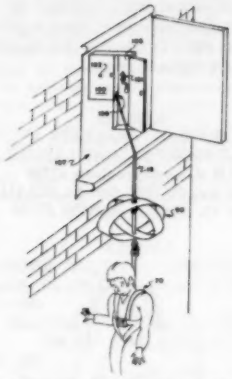
Thomas E. McClung, Old Forge Village, Clifton Forge, Va. 24422

Filed Jun. 10, 1981, Ser. No. 270,852
Int. Cl.³ A62B *1/10*
U.S. Cl. 182—234 **19 Claims**

1. An emergency evacuation system for occupants of high structures comprising:

A. Rotational speed controlled reel means for releasing a weight sustaining line at a substantially constant velocity;

B. Weight confining harness means connected to the leading end of said line; and



C. Weight deployed shield means for deflecting falling debris from striking said weight.

4,432,438

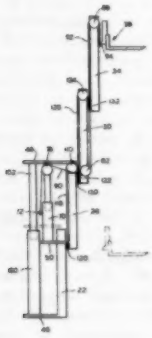
UPRIGHT FOR LIFT TRUCK

Richard H. Robinson, Jr., Kalamazoo, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 232,762, Feb. 9, 1981. This application Feb. 9, 1981, Ser. No. 232,493

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **32 Claims**



26. An upright structure having vertical rails for lift trucks and the like having a fixed upright section, a plurality of telescopic upright sections mounted from said fixed section for simultaneous elevation relative to each other and to said fixed section and load carrier means mounted from one of said telescopic sections for elevation relative thereto, the improvement comprising a first lift cylinder means connected to a movable cylinder support means on one of the telescopic sections other than the telescopic section which is adapted to be actuated to maximum elevation, and a second lift cylinder means connected to a fixed cylinder support means, said first cylinder means being operatively connected to said load carrier means, and said second cylinder means being operatively connected to said plurality of telescopic upright sections.

4,432,439

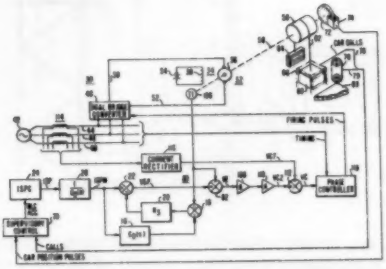
ELEVATOR SYSTEM

William R. Caputo, Wyckoff, N.J., and Masami Nomura, Nagoya, Japan, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 10, 1982, Ser. No. 356,688

Int. Cl.³ B66B *1/30*

U.S. Cl. 187—29 R **6 Claims**



1. An elevator system, comprising:

an elevator car,

speed pattern means providing a speed pattern signal,

a drive system for said elevator car which provides a first output signal in response to said speed pattern signal in accordance with a predetermined actual transfer function,

first means providing a second output signal in response to said speed pattern signal in accordance with a predetermined desired transfer function,

and second means responsive to said first and second output signals for forcing the drive system to adaptively appear to have said predetermined desired transfer function.

4,432,440

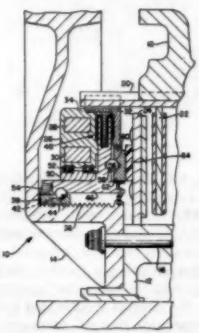
ELECTRICALLY ACTUATED AIRCRAFT BRAKES

Richard L. Crossman, Tallmadge, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 62,199, Jul. 30, 1979, Pat. No. 4,381,049. This application Feb. 11, 1982, Ser. No. 347,851

Int. Cl.³ F16D *55/02*

U.S. Cl. 188—71.2 **11 Claims**



1. A brake control assembly for incorporation with a pressure plate and a brake disk stack, comprising:

a first member operatively connected to a wheel rim and rotatable therewith;

a second member operatively connected to the pressure plate,

said second member being maintained upon a ball screw operative within a spiral groove of fixed length;

a metalized fluid maintained between said members; and

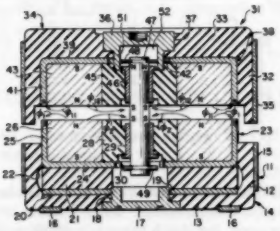
electrically actuated coil means for selectively magnetizing said fluid and thereby imparting rotation of said rotating member to said nonrotating member.

4,432,441

VIBRATION ISOLATION APPARATUS

Masahito Kurokawa, Yokohama, Japan, assignor to Kokka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,691
Claims priority, application Japan, Apr. 13, 1981, 56-54407
Int. Cl.³ F16F 6/00, 7/00, 13/00
U.S. Cl. 188—267 6 Claims



1. A vibration isolation apparatus comprising

a pair of upper and lower casings each having a cylindrical opening which has its open end located opposite to each other;

a pair of substantially cup-shaped upper and lower yoke members of a magnetizable material which are disposed within the respective cylindrical openings of the both casings and having their open ends located opposite to each other;

a pair of upper and lower permanent magnets disposed within the upper and the lower yoke member, respectively, each of the magnets being vertically magnetized and centrally formed with an opening vertically passing therethrough, the openings being aligned with each other on a common axis, and the opposing surfaces of the both magnets presenting magnetic poles of a like polarity;

a pair of upper and lower bearing members of a non-magnetic material disposed in the openings of the both magnets, the both bearing members having openings which are aligned with the common axis;

a connection shaft of a magnetizable material loosely fitted in the openings formed in the bearing members for coupling the pair of permanent magnets together in a manner such that one of the permanent magnets is axially slidable independently from the other permanent magnet;

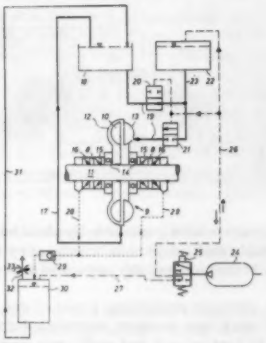
and air damping means including a collar member secured to at least one end of the connecting shaft and a hollow cylinder formed in one of the upper and lower casings which is located adjacent to the collar member and having an opening in which the collar member is tightly fitted.

4,432,442

HYDRODYNAMIC TORQUE-TRANSFER UNIT, ESPECIALLY A HYDRODYNAMIC BRAKE

Klaus Vogelsang, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co KG, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 286,986
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028429
Int. Cl.³ F16D 57/06; B60T 11/00; B60K 41/26; F01D 25/32
U.S. Cl. 188—290 8 Claims



1. Hydrodynamic torque transfer apparatus, comprising:

a housing defining a working chamber for containing working fluid; a stator and a cooperating rotor in the housing for defining transfer means in the chamber, wherein the torque transferred is dependent upon the level of working fluid in the working chamber and the speed of rotation of the rotor with respect to the stator;

an inlet line for delivering working fluid to the working chamber; an outlet line for removing working fluid from the working chamber; fluid recirculating means for connecting the inlet and outlet lines to recirculate working fluid from the outlet line to the inlet line;

the rotor being supported on a shaft extending through the housing; sealing means sealing the shaft in the housing for reducing leakage of working fluid along the shaft;

a leaked fluid recovery line communicating with the rotor shaft outside the sealing means along the shaft for recovering working fluid that leaks past the sealing means; a leaked fluid reservoir connected to receive working fluid recovered by the recovery line; the leaked fluid reservoir communicating with the recirculating means for delivering working fluid thereto;

a working fluid feed reservoir connected to the inlet line for feeding working fluid to the working chamber;

pressurizing means selectively connectable to the feed reservoir for pressurizing the feed reservoir to urge working fluid into the inlet line to the working chamber;

first valve means for selectively connecting the pressurized fluid feed reservoir to the working chamber and for disconnecting them;

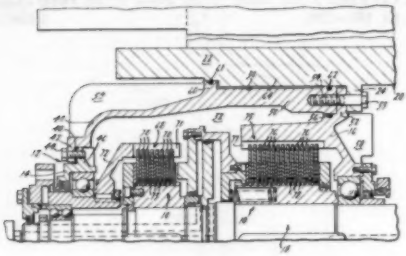
second valve means for selectively connecting the feed reservoir to the leaked fluid reservoir for pressurizing the leaked fluid reservoir with the pressure of the feed reservoir to urge working fluid from the leaked fluid reservoir to the recirculating means, and the second valve means being operable for disconnecting the feed reservoir and the leaked fluid reservoir;

means for coordinating the first and second valve means such that when the pressurizing means is connected to the feed reservoir, the feed reservoir is disconnected from the leaked fluid reservoir, and vice-versa.

4,432,443
CLUTCH AND BRAKE AND IMPROVED UNIVERSAL COUPLING

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed Jan. 21, 1981, Ser. No. 226,635
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—12 R 12 Claims



1. In combination with a rotatable flywheel having a central bore, a rotatable shaft adapted to be rotated by said flywheel, and a clutch-brake unit operably associated with said rotatable shaft,

a housing assembly comprising a pair of end walls and an annular enclosure member extending between and attached to both of said end walls, said housing assembly forming a reservoir chamber around a portion of said shaft and surrounding said clutch-brake unit,

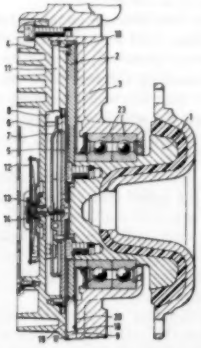
means for removably securing said housing assembly, clutch-brake unit and said shaft as a unit to said flywheel, and

means for orienting said housing assembly within said central bore of said flywheel disposed at an intermediate location on said housing assembly between said means for removably securing and one end wall of said housing assembly.

4,432,444
FLUID FRICTION CLUTCH

Kurt Hauser, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,821
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009665
Int. Cl.³ F16D *35/00*
U.S. Cl. 192—58 B 19 Claims



1. A fluid friction clutch, comprising:

a drive disk having at least one first working surface;

a housing enclosing said drive disk and being mounted rotatably with respect thereto, said housing including at least one second working surface in spaced relationship with said first working surface to form a gap therebetween;

means for selectively introducing a fluid working medium into said gap; and

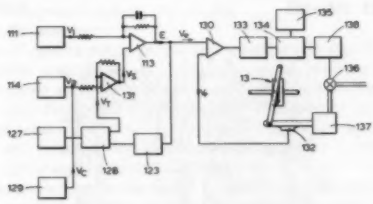
means for removing the fluid working medium from said gap

wherein at least one of said first and second working surfaces comprises a roughened surface, said roughening providing a more uniform filling of the working gap thus reducing uncontrollable throwing of said working medium and fluctuations in r.p.m. as said working medium is introduced.

4,432,445
CLUTCH CONTROL SYSTEMS

Harry M. Windsor, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Jun. 1, 1981, Ser. No. 268,807
Claims priority, application United Kingdom, Nov. 4, 1980, 8035377
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.076 7 Claims



1. A vehicle transmission clutch control system for a vehicle having an engine, a transmission and a friction clutch interposed therebetween, the clutch being selectively engagable for establishing a driving connection between engine and transmission, thereby to load the engine and control engine speed, the control system comprising:

an engine speed sensor;

means for producing an electrical engine speed signal derived from the engine speed sensor;

generator means for producing an electrical reference signal;

a throttle position sensor which produces a throttle signal indicative of throttle position;

means for the summation of the throttle signal and reference signal to produce a modified reference signal;

comparator means arranged to receive and compare the modified reference signal and engine speed signal and produce a consequent error signal;

a clutch actuator that operates the clutch to vary the degree of engagement of the clutch; and

a control means responsive to said modified error signal and controlling the actuator to control the state of engagement of the clutch to control the load on the engine so as to equalize said engine speed signal and modified reference signal until the clutch is fully engaged.

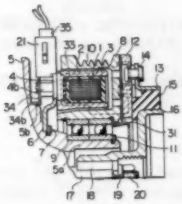
4,432,446
ELECTROMAGNETIC COUPLING APPARATUS

Reijiro Okano, and Kiyoshi Usami, both of Oobu, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 26, 1981, Ser. No. 267,424
Claims priority, application Japan, Jun. 28, 1980, 55-91085; Dec. 11, 1980, 55-178267
Int. Cl.³ F16D *27/10*
U.S. Cl. 192—84 C 8 Claims

1. An electromagnetic coupling apparatus comprising a

rotary body rotated by the driving power from a drive source, an armature disposed in opposed and spaced relation with said rotary body, a magnet coil having terminals projecting therefrom and having a magnetic circuit containing said rotary body and said armature for attracting and holding said armature to said rotary body, a yoke containing said magnet coil, a hub coupled to said armature through an elastic member for transmitting the rotation of said armature, an electric connector in direct contact with said yoke and connected with said magnet coil, and a fixing member for securing said yoke and said electric connector together, said yoke and said fixing member having a through hole through which the terminals of said magnet coil project to the outside of said fixing member, said electric connector having an end connected to an end of said magnet coil in said electric connector.



4,432,447

COIN DETECTING DEVICE FOR A COIN SORTING MACHINE

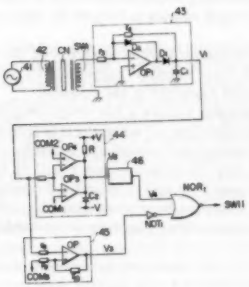
Akio Tanaka, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 25, 1978, Ser. No. 928,023

Claims priority, application Japan, Jul. 25, 1977, 52-89095

Int. Cl.³ G07D *5/08*

U.S. Cl. 194—100 A **1 Claim**



1. A coin detecting device for a coin sorting machine in which a sorting coil for detecting the characteristics of a coin and coin detectors for detecting the passage of a coin are arranged in a coin rolling passageway, successive coin insertion or a coin sorting period is determined by a detection signal provided by said coin detectors, and the variation in impedance of said sorting coil which is caused when a coin passes through said sorting coil is detected to determine whether said coin is a true coin or a false coin, the improvement characterized in that said device further comprises:

discriminating means for discriminating between a true coin and a particular coin by detecting the diameter of the particular coin, said particular coin causing the impedance of said sorting coil to vary in a manner similar to that caused by the true coin, such that the sorting coil erroneously determines that the particular coin is a true coin by generating a sorting signal;

signal transmitting and receiving coils disposed on opposite sides of said coin passageway; and

receiving coil detection circuit means for subjecting the signal induced in said receiving coil by a passing coin to first and second level detections, said detection circuit means providing a first output signal indicative of the passage of said particular coin when the level of the signal in said receiving coil is between said first and second levels for a predetermined minimum period of time;

and wherein said detection circuits means subjects said receiving coil signal to a third level detection and outputs a second output signal indicative of the passage of a coin other than said particular coin when said receiving coil signal traverses said third level but is not between said first and second levels for at least said predetermined minimum period of time;

and wherein said first output signal consists of two pulses within said predetermined period, and said second output signal consists of only one pulse within said predetermined period;

and wherein said machine further includes gate means operable for directing true coins along a true coin path and false coins along a reject path; said device further comprising:

up/down counter means responsive to said first and second output signals for producing a count signal only in response to said second output signal; and logic circuit means responsive to a sorting signal and to the absence of said count signal for producing, at the end of said sorting period, a control signal for operating said gate means to direct said particular coin along said reject path.

4,432,448

CONVEYOR TROUGH FOR A SCRAPER CHAIN CONVEYOR

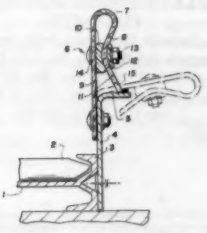
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 334,073

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049253

Int. Cl.³ B65G *19/28*

U.S. Cl. 198—735 **7 Claims**



1. A conveyor trough for a scraper chain conveyor comprising a sheet metal bracket which is adapted to be secured along the side wall of the trough and which has a wall with an inside facing the trough and an upper portion with an outwardly bent cover leg, and an attached bracket secured to the inside of the metal bracket and made of a resiliently bending material and projecting upwardly from said cover leg of said metal bracket, said attached bracket having a loop forming bend forming the upper edge thereof, and an outwardly extending stabilizing leg propped against said cover leg of said metal bracket.

4,432,449

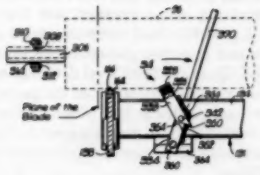
LOG CUTTING DEVICE HAVING LOG SHIFTING MEANS

Leslie A. Neff, 2020 W. 15th, Emporia, Kans. 66801

Division of Ser. No. 119,403, Feb. 7, 1980, Pat. No. 4,331,052. This application Dec. 28, 1981, Ser. No. 334,464

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—777 **3 Claims**



1. Handling apparatus for an elongated object such as a log or the like, comprising:

means for supporting said object along the length thereof; and

means for incrementally axially and forwardly shifting said object as desired, said shifting means including

an object-shifting member disposed below said object and having a lower portion, an upper portion, means carried by said upper portion for engaging said object, and means pivotally coupling the upper and lower portions; and

means operatively connected to said member for selective fore and aft pivotal movement thereof about an axis transverse to the longitudinal axis of said object,

said coupling means including structure for preventing pivoting of said upper and lower portions relative to each other during pivoting of the member in a forward direction for said forward axial shifting of said object, and for permitting pivoting together of the upper and lower portions upon rearward pivoting of the member in a direction opposite to said forward direction,

said coupling structure including complementary, adjacent, obliquely oriented engagement surfaces on said upper and lower portions respectively, said surfaces being cooperatively arranged for collapsing together of said upper and lower portions upon rearward shifting of said member to an extent to clear said object.

4,432,450

MESH-BELT CONVEYOR FOR INDUSTRIAL FURNACES

Oddino Dorigo, Bagnolo Cremasco, Italy, assignor to Societa' Industriale Bagnolo S.I.B. S.r.l., Bagnolo Cremasco, Italy

Filed Oct. 1, 1981, Ser. No. 307,636

Claims priority, application Italy, Oct. 2, 1980, 25093 A/80

Int. Cl.³ B65G *23/00*

U.S. Cl. 198—832 **8 Claims**

1. An endless belt conveyor disposed in an elongated path having at one end an idle reversing roller about which the conveyor is trained and at the other end a labyrinth device through which the endless conveyor is trained, means mounting the labyrinth device for movement toward and away from the reversing roller, the labyrinth device when moving away from the reversing roller exerting greater friction on the endless belt conveyor than when moving toward the reversing roller, the endless belt conveyor having substantial slack when said labyrinth device is nearest said reversing roller, and means for gripping and advancing said slack toward said reversing roller, said labyrinth device and said means for gripping and advancing cooperatively serving to intermittently advance said endless belt conveyor.

4,432,451

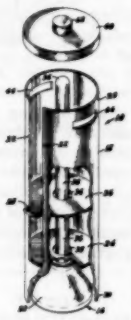
BATHROOM ACCESSORY

Oneida O. Hooser, 313 N. Church (Brooklyn), Mooresville, Ind. 46158

Filed Mar. 9, 1983, Ser. No. 473,530

Int. Cl.³ B65D *85/67*

U.S. Cl. 206—216 **10 Claims**



1. A cannister device for storage of toilet tissue in rolled form, comprising:

a generally cylindrical enclosure housing, of an internal diameter large enough to accommodate the diameter of a roll of toilet tissue;

the housing being open at its upper end, and provided with a slot extending downwardly from its upper end continuously a length at least as long as the length of a roll of said tissue;

tray-support means located inwardly of the housing; and

a movable tray member supported by said tray-support means, and inwardly of the housing;

the tray member having a lug which extends outwardly of the slot of the housing when the tray member is positioned in the housing, and providing a manually graspable handle for the tray by which it and a roll of tissue supported thereon may be raised to an upward position such that the roll of tissue may be grasped from above the upper end of the housing without reaching downwardly into the housing.

4,432,452

PROTECTIVE RAZOR PACKAGE

John F. Kelly, Randolph, Mass., assignor to The Gillette Company, Boston, Mass.

Filed May 19, 1982, Ser. No. 379,592

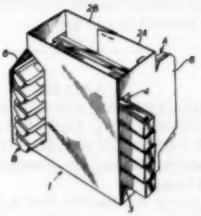
Claims priority, application United Kingdom, Jun. 19, 1981, 8118888

Int. Cl.³ B65D *75/58;* **A45D** *27/29;* **B65D** *75/64*

U.S. Cl. 206—354 **3 Claims**

1. A package for a plurality of razors each having an elongated handle and a transversely extending shaving head at the upper end thereof, the package being formed from card which is cut, shaped and secured to form an envelope having an opposed pair of side walls forming a first side wall and a second side wall and an opposed pair of end walls forming a first end wall and a second end wall, a first group of razors being accommodated in the envelope with the lower end portions of

their handles projecting through only said first end wall and with portions of their heads projecting through only said first side wall, and a second group of razors in a side-by-side orientation with said first group of razors and being reversed end for



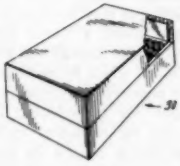
end with those of the first group, and having the lower end portions of their handles projecting through only said second end wall, and portions of their heads projecting through only said second side wall.

4,432,453

STORAGE SYSTEM FOR EITHER BOXED OR UNBOXED CASSETTES

Joseph L. Berkman, Mamaroneck, N.Y., assignor to Berkman Industries, Inc., Boynton Beach, Fla.

Filed Sep. 30, 1982, Ser. No. 429,200
Int. Cl.³ B65D *85/30, 85/62*
U.S. Cl. 206—387 **12 Claims**



1. A storage case for magnetic tape cassettes and tape cassette boxes comprising at least one row having a plurality of tandem compartments for interchangeably receiving and storing either a boxed cassette or a pair of unboxed cassettes in the same compartment, each said compartment having opposite side walls connected by means of a bottom wall, and having twin parallel storage zones disposed transverse to said opposite side walls; each said compartment further comprising projection means separating and dividing said compartment into said twin parallel storage zones on either side of said projection means; said opposite side walls having pairs of vertical ribs for guiding and securely retaining a single boxed cassette in place in said compartment atop said projection means, and vertical end stops adjacent said vertical ribs for limiting transverse movement of unboxed cassettes stored and securely retained between said projection means and oppositely disposed compartment separating guides projecting inwardly from said opposite side walls.

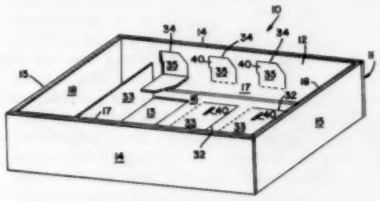
4,432,454

COMPARTMENTALIZED DOCUMENT CARRIER CARTON

Otis J. Bloom, 478 Richmond Dr., Millbrae, Calif. 94030

Filed Sep. 20, 1982, Ser. No. 420,029
Int. Cl.³ B65D *5/48, 85/00*
U.S. Cl. 206—425 **10 Claims**

3. A document carrier carton having a bottom wall, a pair of side walls and a pair of end walls, said bottom wall having a plurality of spaced U-shaped slits therethrough with the portions of said bottom wall within said slits being bendable upwardly in spaced parallel relation to define partitions extending parallel to said end walls of said carton, said side walls having a plurality of spaced substantially U-shaped slits therethrough with the portions of said side walls within said slits bendable inwardly in spaced relation to each other into parallel relation



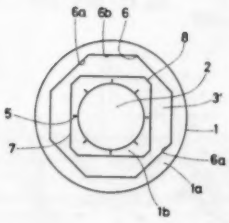
to said body part to provide abutment members between said partitions at each end thereof, and means for removably fixing each of said abutment members of one side wall together with a corresponding one of said abutment members of the other of said side walls to a different one of said partitions.

4,432,455

SUPPORT FOR TABLETS, CAPSULES, PILLS OR THE LIKE

Jean-Claude Savoir, 43, rue de Lausanne, 1201 Geneva, Switzerland

Filed Nov. 9, 1981, Ser. No. 321,174
Claims priority, application France, Mar. 11, 1980, 80 05425
Int. Cl.³ B65D *83/04*
U.S. Cl. 206—531 **3 Claims**



1. Packaging for supporting tablets, capsules, pills or the like articles on the neck of a container, said packaging comprising an inner annular disc having a central opening of a size and shape to fit frictionally on the neck of a container, an outer annular disc surrounding said inner disc with article-receiving spaces between the outer periphery of said inner disc and the inner periphery of said outer disc, said articles being received in said spaces; and two coatings adhering respectively to opposite faces of said discs to unite said disc in a unitary packaging and retain said articles in said spaces.

4,432,456

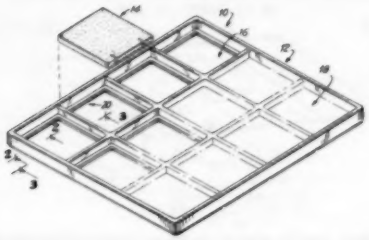
JEWELRY DISPLAY AND STORAGE APPARATUS

Joseph Ovadia, and Abraham Ovadia, both of 150 W. 47th St., New York, N.Y. 10036

Filed Jan. 4, 1982, Ser. No. 336,819
Int. Cl.³ B65D *1/36, 6/04*
U.S. Cl. 206—566 **10 Claims**

1. A jewelry display and storage apparatus comprising a frame defining an open gridwork, said gridwork being formed of a series of vertically extending walls, each of said walls terminating at its lower edge in a horizontally projecting step; one or more jewelry mounting pads mounted within said gridwork, said jewelry mounting pads having a top surface upon

which jewelry may be mounted and displayed, a bottom surface, and peripheral depending sides adapted to be embraced by said walls and supported by said projecting steps such that said gridwork and said bottom surface of said pads form an open-bottom chamber below said pads, said walls being so



dimensioned and arranged to permit identical frame members to be stacked one atop the other, such that jewelry mounted on a mounting pad of a first display apparatus sits within an open-bottom chamber of the next stacked apparatus and is completely surrounded by and separated from adjacent jewelry items by walls of the next stacked apparatus.

4,432,457

ARTICLE SELECTION APPARATUS

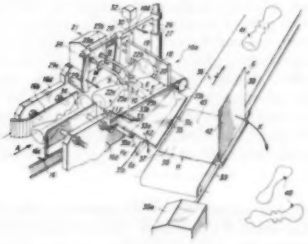
Yuji Sawa, and Yozo Kudo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1981, Ser. No. 235,877

Claims priority, application Japan, Feb. 25, 1980, 55-22533; Mar. 14, 1980, 55-32998

Int. Cl.³ B07C *5/04*

U.S. Cl. 209—557 **14 Claims**



1. An article-selection apparatus comprising a first conveying means for conveying an article, a second conveying means for receiving said article at an entrance end spaced apart by a predetermined distance from a conveying end of said first conveying means and for conveying the received article, a stopper for abutting against a downstream end of said article to be selected and conveyed by said second conveying means and for stopping said article, a discrimination means for discriminating a shape of said article abutted against said stopper at said downstream end thereof and for generating discriminating signals, a third conveying means having an entrance portion adjacent to said second conveying means, a pushing means for pushing said article to be selected out to said entrance portion of said third conveying means, a selection member for guiding the pushed-out article to said entrance portion of said third conveying means when said selection member is set to a first position and for guiding said pushed-out article outside of said third conveying means when said selection member is set to a second position, and a setting means for setting the position of said selection member according to said discriminating signals from said discriminating means, said first conveying means having a gap which extends along the conveying path to a conveying end thereof and said gap having a width smaller than said predetermined distance from said conveying end of said first conveying means to said entrance end of said second conveying means and said first conveying means comprising two conveying sections each of which has a conveying surface downwardly inclined to said gap.

4,432,458

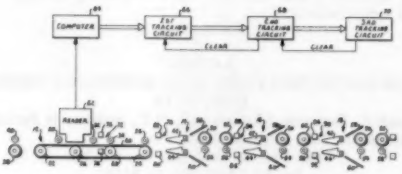
ELECTRONIC CONTROL SYSTEM FOR MONITORING AND CONTROLLING THE MOVEMENT OF AN ENVELOPE THROUGH A MAIL SORTING MACHINE

Henry A. Daboub, Dallas, Tex., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 204,588, Nov. 6, 1980, abandoned. This application Dec. 23, 1981, Ser. No. 333,768

Int. Cl.³ B07C *3/06, 5/36*

U.S. Cl. 209—564 **6 Claims**



1. In a mail sorting machine having a plurality of deflecting gates which are arranged in pairs to provide a single guideway through which envelopes may be asynchronously conveyed, each deflecting gate having a normal position in which an envelope is allowed to pass through said guideway unimpeded and a deflect position in which an envelope is deflected out of said guideway, the improvement therein of a tracking circuit associated with each pair of deflecting gates and interconnected in series with the remaining tracking circuits, each tracking circuit serving to control the position of the gates, each successive tracking circuit comprising:

sensing means for generating an alert signal in response to an approaching envelope;

means for accepting from a preceding tracking circuit an encoded designation signal in response to an alert signal, said designation signal being arranged to have a location portion which is encoded to represent a particular numerical value and an encoded gate designating portion;

each tracking circuit for a succeeding pair of gates including means for generating and transmitting a clear signal to the tracking circuit of the immediately preceding pair of gates to clear the designation signal therefrom upon the acceptance of said encoded designation signal by said tracking circuit for a succeeding pair of gates and irrespective of the elapsed time of movement of an envelope between adjacent pairs of gates as sensed by successive tracking circuits;

means for changing the numerical value of said location portion of said designation signal by a set numerical quantity to thereby produce an updated designation signal;

means for comparing the numerical value represented by the location portion of the new designation signal with a preselected numerical value; and

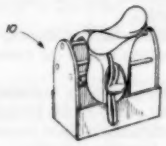
means for examining the gate designating portion of said new designation signal if the numerical value represented by the location portion of the updated designation signal coincides with said preselected numerical value, said examining means also being operable to cause the deflecting gate designated by the gate designating portion of said updated designation signal to be placed in a deflect position.

4,432,459

TACK BOX AND SADDLE RACK UNIT

Margaret E. Coldren, R.D. #1, Abbottstown, Pa. 17301

Filed Mar. 6, 1981, Ser. No. 241,423
Int. Cl.³ A47F 7/00
U.S. Cl. 211—13 1 Claim



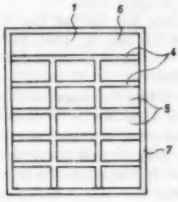
1. A tack box and saddle rack unit comprising in combination, a generally rectangular box including a lower portion having parallel side panels of equal height and a unitary bottom panel, the opposite ends of which are secured respectively to the opposite side and bottom edges of the lower portion of parallel vertical end members having upper portions which extend a substantial distance above the upper edges of said side panels comprising the lower portion of the box, an uppermost rail extending between the uppermost portions of said end members centrally thereof in the upper portion of the box to support a saddle, and a pair of side rails respectively extending between the upper portions of said end members within a common horizontal plane above the upper edges of said side panels a distance substantially equal to the height of said side panels in a somewhat triangular arrangement with said uppermost rail and respectively being spaced a short distance inward from the outer edges of said end members and within vertical planes parallel to but spaced inward from the inner surfaces of said side panels of the lower portion of said box and operable to have stirrup straps and other depending side members of a saddle draped along the outer surfaces of said side rails for disposition of stirrups and other accouterments within the box of the unit, said upper portions of said end members extending above the lower portion of the box defined by the upper edges of said side members a distance greater than the height thereof and said central uppermost rail being above said pair of side rails, whereby all of said rails are in the upper portion of said box above the lower portion thereof.

4,432,460

DEVICE FOR THE RECEPTION OF LEAF-SHAPED BODIES ESPECIALLY OF SHEETS OF PAPER

Barbara E. Bell, Achalmstr. 4, D-7447 Aichtal, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,737
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947397
Int. Cl.³ A47F 5/08
U.S. Cl. 211—50 8 Claims



1. An apparatus for receiving and holding flat bodies such as cards or sheets for display thereof, the apparatus comprising the combination of

first and second generally planar, plate-like wall members;

a plurality of separating strips extending longitudinally and transversely between said wall members for maintaining said wall members in substantially parallel, spaced relationship and for dividing the volume between said wall members into a plurality of compartments;

said first wall member being transparent at least in the regions of said compartments, and

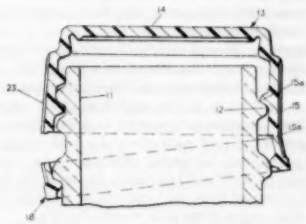
means defining a plurality of slots through said second wall member, each of said slots opening into one of said compartments adjacent a separating strip defining a top side of the compartment when the apparatus is in a normal, upright position, said slots being formed such that bodies placed in said compartments tend to remain therein when said apparatus is inverted.

4,432,461

TAMPER INDICATING PACKAGE

George V. Mumford, and Ernest L. Li, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 9, 1982, Ser. No. 366,796
Int. Cl.³ B65D 41/34
U.S. Cl. 215—252 12 Claims



1. A tamperproof package comprising

a container having a neck with external threads formed thereon,

a plastic closure comprising a top panel and an integral depending annular skirt,

said skirt having integral internal threads formed thereon complementary to the threads on the neck of the container,

said container having an annular bead positioned axially below the threads,

said skirt having a ring at the lower end thereof connected to the upper portion of the skirt by a plurality of circumferentially spaced integral bridge portions located below the threads when the closure is on the container,

said ring having a radially inwardly extending annular rib engaging beneath the locking bead of the container when the closure is on the container,

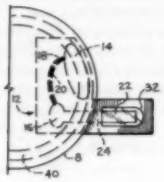
the thickness of the ring being such that the ring will flex to an oval configuration,

one of said bridge portions having a greater cross section than the remainder of said bridge portions such that when the closure is applied to the container, the rib on the pilfer ring snaps over and engages below the annular bead on the container, and when the closure is rotated to remove the closure from the container, the bridge portions are broken except for the bridge portion having the greater cross section, the ring will flex to an oval configuration as the closure is being removed so that the ring will pass over the annular bead of the container into the space between the threads of the container and the bead such that the pilfer ring remains connected to the closure.

4,432,462
RECEPTACLE TAMPERING INDICATOR AND METHOD THEREFOR

Randall A. Newkirk, 22700 Lake Forest, #411, El Toro, Calif. 92630

Filed Oct. 18, 1982, Ser. No. 435,017
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—365 **20 Claims**



1. An indicator to provide a warning of tampering with a receptacle, said indicator to be positioned between a cap for closing said receptacle and a rim of said receptacle through which the contents of the receptacle are loaded, said cap being removably connected to said receptacle at the rim thereof, and said tampering indicator comprising:

fluid supply means,

fluid indication means responsive to and providing an indication of the presence of a fluid thereat, and

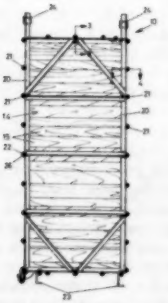
fluid path means interconnecting said fluid supply means with said fluid indication means,

said fluid supply means and said fluid path means being moved into engagement with the rim of said receptacle when the cap is connected thereto, so as to force fluid from said supply means into said path means, said fluid path means being blocked from communication with said indication means at the engagement of said path means by said receptacle rim, said fluid path means becoming unblocked to permit fluid to be conveyed to said fluid indication means in the event that the cap is removed from said receptacle and said fluid path means is disengaged from said receptacle rim.

4,432,463
WINE STORAGE CONTAINER

Leslie R. MacDonald, 15 Balfour Rd., Springfield, South Australia, and Wouter Verschoor, 5 Enford St., Elizabeth, South Australia, both of Australia

Filed Mar. 18, 1981, Ser. No. 245,084
Claims priority, application Australia, Mar. 25, 1980, PE2910
Int. Cl.³ B65D *6/24*
U.S. Cl. 217—12 R **5 Claims**



1. A container for the storage of wine, comprising:

a plurality of channel section members interconnected to define the container shape, each member having a central web and a flange on each longitudinal side of the web, the webs of said channel section members together defining upper, lower and end walls of the container and bounding two open vertical sides of the container,

a pair of timber panel assemblies, one on each of said open vertical sides bounded by the channel section members, each timber panel assembly engaging the corresponding flanges of the channel section members,

resilient jointing material between each of said flanges of the channel section members and the associated one of the timber panel assemblies,

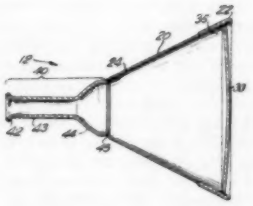
a pair of clamping frames, each contiguous with the outer surface of the respective one of the timber panel assemblies,

and a plurality of clamping bolts extending between the clamping frames and clamping the clamping frames, the timber panel assemblies, the resilient jointing material and the channel section members together.

4,432,464
LARGE METAL CONE CATHODE RAY TUBES, AND ENVELOPES THEREFOR

Peter Seats, Boonton; Emil Sanford, Montclair, and Bernard M. Waxenbaum, Paramus, all of N.J., assignors to Thomas Electronics, Inc., Wayne, N.J.

Filed Sep. 9, 1981, Ser. No. 300,682
Int. Cl.³ H01J *31/00, 61/30*
U.S. Cl. 220—2.1 A **18 Claims**



1. A large cathode ray tube envelope comprising a metal truncated cone and a curved glass faceplate sealed to the large end of the cone, said faceplate comprising an inner surface and an outer surface, characterized by a beveled edge on the faceplate, said beveled edge comprising a substantially straight, radially, outwardly facing surface defining the outermost perimeter of said faceplate and joining the inner and outer surfaces of said faceplate, and a layer of solder glass between the beveled edge and the metal cone forming a hermetic seal between them, wherein the faceplate is supported solely by the beveled edge, and the angle of the bevel with respect to an axis through the center of the faceplate is substantially the same as the angle of the sealing zone of the metal cone and less than approximately 45°.

4,432,465
FIRE RATED CLOSURE PLUG

Emil S. Wuertz, Madison, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 309,166, Oct. 6, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,529
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—235 **11 Claims**

1. A closure fitting for installation in a generally circular opening in a fire rated barrier to maintain the integrity of the barrier comprising the combination of

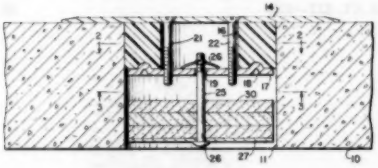
a cover plate dimensioned to cover and extend beyond the periphery of the opening and lie adjacent one surface of the barrier;

generally annular gripping ring means having a continuous circular peripheral surface of compressible elastomeric

material for fixing the position of the fitting in the opening, said ring means having an outer diameter equal to or less than that of the opening and having an axial thickness significantly less than that of the barrier, one face of said ring means being adjacent a surface of said cover plate;

a generally circular pressure plate adjacent the opposite face of said ring means and having a diameter smaller than said opening;

means extending between said cover plate and said pressure plate for urging said plates toward each other to axially



compress and radially expand said ring means against the opening;

a body of intumescent material having a diameter normally smaller than said opening; and

means for supporting said body of intumescent material in generally parallel relationship with said pressure plate, said means for supporting said body of intumescent material being adjustable relative to said pressure plate, whereby said body of intumescent material is positionable adjacent an opposite surface of the barrier.

4,432,466

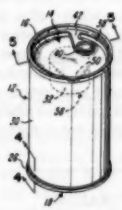
CONTAINER HAVING CLOSURE PANEL INCLUDING INTEGRALLY FORMED SCOOP RUPTURABLE THEREFROM

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Continuation of Ser. No. 345,344, Feb. 3, 1982, abandoned, which is a continuation of Ser. No. 205,458, Nov. 10, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 444,545

Int. Cl.³ B65D *17/40*

U.S. Cl. 220—276 **10 Claims**



1. A container construction comprising a generally tubular wall, a panel disposed to close one end of said tubular wall, a scoop wall integral with said panel and projecting into the space surrounded by said tubular wall, rupturable web means one piece with said panel, said web means joined to said tubular wall in surrounding relation to said panel, said panel having an endless first rupturable scoreline surrounding said scoop wall, said first scoreline including a bight portion which is spaced outwardly from said scoop wall, said panel having an arcuate second rupturable scoreline merging with said bight portion, said panel having a third rupturable scoreline extending from said second scoreline to said web means, and pull-out means integrally affixed to said panel adjacent said third scoreline.

4,432,467

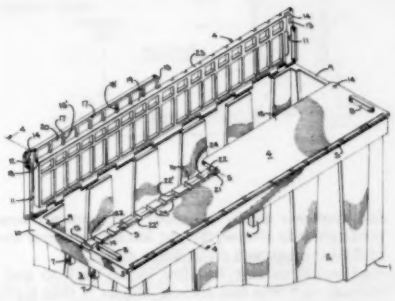
REINFORCED LID CONSTRUCTION FOR SECURITY CONTAINERS OR THE LIKE

Harold E. Swingley, Jr., Monona, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed Mar. 8, 1982, Ser. No. 355,364

Int. Cl.³ B65D *43/14*

U.S. Cl. 220—334 **6 Claims**



1. In a security container or the like having opposite hinged lid sections that meet along a line of closure, each lid section having at its free edge a relatively lower shelf area and a relatively upper area that overlaps the shelf of the other lid section when the lid sections are closed, the undersides of the upper areas being provided with downwardly extending vertical peripheral reinforcing flanges that are generally U-shaped and include forward main portions generally parallel to the line of closure and generally transverse end portions joined to and extending rearwardly therefrom, the shelves being provided with upwardly extending vertical peripheral outer abutment walls that include rear main portions generally parallel to the line of closure and generally transversely forwardly extending end portions and that are substantially coextensive with and facingly engageable with the corresponding outer surfaces of the reinforcing flanges when the lid sections are closed, the improvement wherein:

the shelves are provided with upwardly extending vertical inner abutment wall structures that are inside the reinforcing flanges when the lid sections are closed, said inner abutment wall structures comprising rear walls that are substantially coextensive and facingly engageable in wall to wall fashion with the main portions of the reinforcing flanges when the lid sections are closed, and end walls joined to and extending forwardly from the rear walls that are substantially coextensive and facingly engageable in wall to wall fashion with the corresponding end portions of the reinforcing flanges when the lid sections are closed.

4,432,468

INTRAVENOUS DELIVERY SYSTEM

Elliott J. Siff, 15 Broadview Rd., Westport, Conn. 06880, and Claude L. Emmerich, 15 Hutchinson Ave., Scarsdale, N.Y. 10583

Filed Feb. 6, 1981, Ser. No. 232,248

Int. Cl.³ G01F *11/08*

U.S. Cl. 222—55 **19 Claims**

13. A quantizer for delivering fluid in discrete units, comprising in combination,

a container,

a source of pressurized fluid,

diaphragm means fixed to one end of said container capable of expanding in one direction,

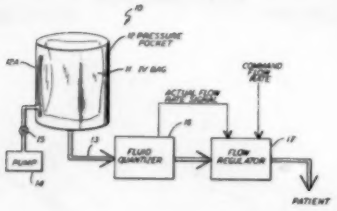
inlet valve means connected to said source of pressurized fluid,

outlet valve means,

first means disposed within said container means having a

first position closing said outlet valve means and opening said inlet valve means and a second position opening said outlet valve means and closing said inlet valve means,

spring means disposed within said container means for moving said first means from said first position to said second position each time sufficient fluid has been introduced into



said container means to expand said container means a predetermined amount thereby forcing a discrete amount of fluid through said outlet valve means,

second means moving said first means back to said first position each time said discrete amount of fluid is emitted through said outlet valve means.

4,432,469

DEVICE FOR DISCHARGING A PLURAL-COMPONENT MATERIAL

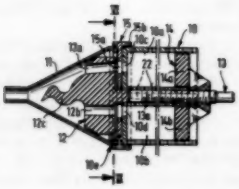
Monika Eble, and Gusztav Lang, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 4, 1980, Ser. No. 213,180

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949369

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—134 **12 Claims**



1. Device for the measured discharge of a plural-component material such as an adhesive, sealing, filling or putty-like substance comprising a casing having a first end, said casing divided into separate compartments each extending from said first end, each said compartment arranged to hold a component of the plural-component material so that the components are maintained separate until ready to be mixed, each of said compartments having a discharge opening at said first end of said casing, a mixing chamber mounted on said first end of said casing for receiving the components from said compartments, a member interposed between said first end of said casing and said mixing chamber, said member being rotatable about an axis extending transversely of said first end, said member having passageways extending therethrough alignable with said discharge openings from said first end of said casing for conveying the components of the plural-component material from said compartments into said mixing chamber, said rotatable member is a rotational slide, a shut-off slide rotatable about the same axis as said rotational slide and located between said first end of said casing and said rotational slide, said shut off slide having bores therethrough for permitting flow between said discharge openings from said compartments into said passageways through said rotational slide so that by selectively rotating said shut-off slide flow from said compartments can be blocked.

4,432,470

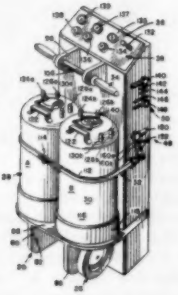
MULTICOMPONENT LIQUID MIXING AND DISPENSING ASSEMBLY

Timothy J. Sopha, Elgin, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Jan. 21, 1981, Ser. No. 226,860

Int. Cl.³ B67D *5/52*

U.S. Cl. 222—135 **35 Claims**



1. An apparatus for supplying A and B liquids from A and B sources, respectively, to a mixing head or the like, said apparatus having A and B pumps each having a pump member movable from a first toward a second position, means rigidly mechanically connecting the A and B pump members for simultaneous movement toward said first and second positions, drive means operable in one direction to move said pump members from their first toward their second positions, and A and B conduit means connecting said A and B sources to said A and B pumps, respectively, the improvement which comprises A and B valve means in said A and B conduit means, respectively, said valve means each having outlet means for connection to a mixing head or the like and each having a first position permitting flow of liquid from the respective pump through its outlet means on movement of said pump members toward their second positions, said A and B valve means each having a second position providing communication between said A and B sources and said A and B pumps, respectively, and means to cause said A and B liquids to hydraulically bias said pump members operating through said means rigidly mechanically connecting the A and B pump members toward their first positions when said A and B valve means are in their second positions.

4,432,471

TWO PHASE PRODUCT DISPENSER

Harry Hayes, Warrington, England, assignor to Colgate-Palmolive Company, New York, N.Y.

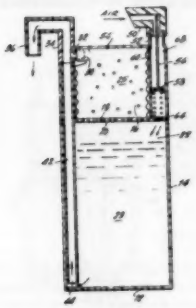
Filed Oct. 1, 1981, Ser. No. 307,460

Int. Cl.³ B67D *5/54*

U.S. Cl. 222—136 **13 Claims**

1. A dispenser comprising a container having an upper section and a lower section, a perforated plate separating said upper section from said lower section, first product within said lower section with an air space existing between said first product and said plate, deformable membrane means overlying said plate, second product in said upper section with said membrane means separating said second product from said plate, a lower delivery tube section connected to said lower section of said container, an upper delivery tube section connected to said upper section of said container, nozzle means

communicating with said delivery tube sections, and pump means on said container for introducing air under pressure into

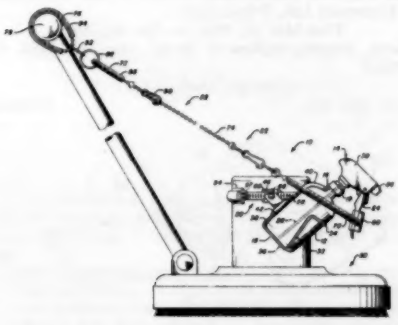


said air space for simultaneously forcing said first product and said second product through said nozzle.

4,432,472
SPRAYER ATTACHMENT FOR A FLOOR BUFFING MACHINE

George L. Lamm, Melrose, Mass., assignor to G & L Manufacturing & Develop. Corp., Melrose, Mass.

Filed Jun. 11, 1982, Ser. No. 387,706
Int. Cl.³ B05B 15/06; A47L 11/40
U.S. Cl. 222—174 3 Claims



1. A sprayer unit for attachment to a floor buffing machine comprising:

a container for holding a quantity of a liquid to be sprayed and having normally generally vertical side walls;

a manually actuated sprayer head removably attached to said container, said sprayer head having a trigger for actuation thereof and a nozzle for propelling liquid from said container onto a surface to be sprayed;

means surrounding said container for supporting said container, said supporting means having a flexible finger biased against one portion of said side walls of said container to urge an opposite portion of said side walls of said container against a confronting portion of said supporting means to normally retain said container within said supporting means, said finger permitting said container to be inserted and removed from said supporting means by deflection of said finger;

a band having an adjustable circumferential length;

means for adjusting the length of the circumference of said band for tightly securing said band to a housing of a floor buffing machine;

bracket means secured to said metal band and having at least two generally normally disposed surfaces formed thereon, said bracket means being slidable with respect to said band to allow positioning thereof at a selected location on the buffing machine housing;

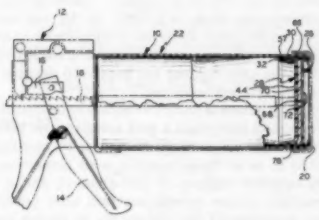
means for selectively pivotally mounting said supporting means to one of said surfaces of said bracket means; and

a chain having one end thereof secured to said trigger of said sprayer head and the other end extending to the handle of the buffing machine for actuating said trigger of said sprayer head.

4,432,473
CARTRIDGE-TYPE DISPENSER

George E. MacEwen, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.

Filed Feb. 21, 1984, Ser. No. 237,808
Int. Cl.³ B65D 85/72
U.S. Cl. 222—327 33 Claims



1. A container comprising:

a generally cylindrically shaped tubular side wall formed of a delaminable laminated sheet material and having an inner surface and first and second open end portions, the first open end portion terminating in a radially inwardly rolled lip;

a generally flat circular disc disposed within said tubular side wall in abutting relation with the radially inwardly rolled lip, said circular disc having a plurality of slits therethrough and mutually intersecting at a point positioned generally in the center of said circulating disc;

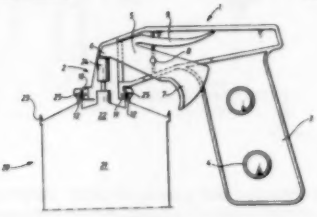
means disposed about the periphery of said circular disc and communicating between said circular disc and said tubular side wall for securing said circular disc within said tubular side wall in abutting relation with said inwardly rolled lip and providing a substantially liquid tight seal between said circular disc and said tubular side wall; and

plug top closure means disposed within said tubular side wall adjacent the second open end portion thereof, said plug top closure means having a closure side wall sized and shaped to be closely received within the second open end portion of said tubular side wall, said closure side wall having radially outwardly extending closure lip means on a first end portion thereof adapted for yieldably engaging the inner surface of said tubular sidewall and formed of a normally solid thermoplastic material fusion sealed to the inner surface of said tubular side wall, and said plug top closure means further including generally radial end wall means extending across and closing a second end portion of said closure side wall.

4,432,474
HANDLE AND ACTUATING DEVICE FOR PRESSURIZED DISPENSERS

Paul Hutchinson, and Alan Serginson, both of Acklam, England, assignors to Can-Gun Limited, Acklam, England

Filed Jul. 1, 1981, Ser. No. 279,265
Claims priority, application United Kingdom, Jul. 8, 1980, 8022233; Sep. 3, 1980, 8028427; Feb. 3, 1981, 8103261
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.15 **12 Claims**



1. A combined handle and actuating device for a pressurised dispenser of the kind comprising a container containing a pressurised active ingredient and having a discharge valve assembly manually operable by a depressable actuating member, the valve assembly including an annular channel which opens towards the actuating member, which device comprises a body having a handle to be gripped by the user and coupling means adapted for ready supportive attachment to and detachment from the dispenser, and an actuating means operable by the hand of the user holding the handle to depress or release the actuating member, wherein:

the coupling means is made of resiliently deformable plastics material and comprises a part annular nose portion and a part annular tail portion diametrically opposed relative thereto so as to be engageable with respective diametrically opposed regions of said channel, and a cantilever connecting means connecting said nose portion to said body downwardly and forwardly to permit resilient deformation of the nose portion relative to the body, diametrically opposed peripheral recesses arranged in the coupling means between the nose portion and the tail portion in order to define said cantilever connection of the nose portion to said body downwardly and forwardly which renders the nose portion more readily deformable than the tail portion, the device being attachable to the dispenser via said coupling means by first inserting the nose portion fully into a region of said channel followed by relative pivotting of the device about the nose portion accompanied by resilient deformation of the nose portion so as to bring the tail portion into snap-fitting engagement with a substantially diametrically opposed region of the channel.

4,432,475
AUTOMATIC WASH TANK DRAIN/FILL APPARATUS FOR PROCESSOR OF PHOTOSENSITIVE MATERIAL

Conrad E. Lee, Golden Valley, and Jerry A. Caflisch, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Nov. 16, 1981, Ser. No. 321,913
Int. Cl.³ B22D *37/00*; B08B *3/00*
U.S. Cl. 222—509 **25 Claims**

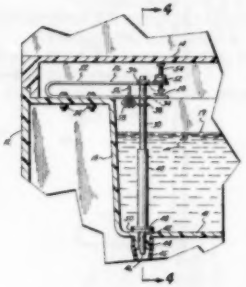
1. A drain apparatus for a processor of photosensitive material comprising:

a tank for containing fluid;

a movable cover having an operating position covering the tank when the processor is in operation and being displaceable from the operating position to permit venting of an interior portion of the processor when the processor is not in operation;

a valve for draining fluid from the tank, the valve having an open state which permits draining and a closed state which prevents draining;

bias means for biasing the valve to its open state;

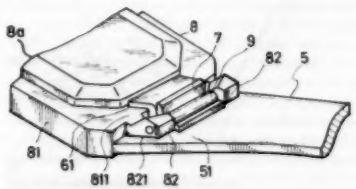


means responsive to the position of the cover for maintaining the valve in its closed state when the cover is in its operating position covering the tank and permitting the bias means to bias the valve to its open state when the cover is displaced from its operating position.

4,432,476
BAND ATTACHMENT ASSEMBLY FOR ATTACHING A WATCHBAND TO A WATCHCASE

Koichi Yokosuka, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,269
Claims priority, application Japan, Mar. 12, 1982, 57-34759[U]
Int. Cl.³ A44C *5/00*
U.S. Cl. 224—164 **22 Claims**



1. A band attachment assembly for attaching a wristband to an article to be worn on the wrist of a wearer comprising:

means including a pin connectable to the article for defining a clearance between the pin and an end portion of the article;

holding means connected to one end of the wristband and configured to be inserted through the clearance for releasably engaging with a rear portion of the article to thereby hold the wristband in a predetermined position relative to the article and locking means for locking the wristband in said predetermined position relative to the article.

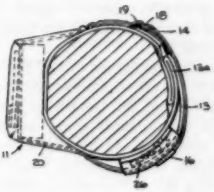
4,432,477
CARRIER FOR MUSIC PLAYER

Jonathan D. Haidt, and Elaine Haidt, both of 35 Church La., Scarsdale, N.Y. 10583

Filed Sep. 22, 1982, Ser. No. 421,339
Int. Cl.³ A45C *11/00*
U.S. Cl. 224—222 **12 Claims**

1. An armband carrier for a music player or the like comprising a continuous annular flexible carrier body for encircling a

wearer's upper arm, a pocket sized to hold a player, belt means permanently attached at one end of said carrier body and means associated with said belt means for applying tension to the belt means for adjusting the armband to secure the armband in place on a wearer's arm, wherein said means associated with the belt means for applying tension comprises a loop for passage of the belt means through said loop and means in said carrier body for securing in place an end of said belt means which is not permanently attached to said carrier body.



4,432,478

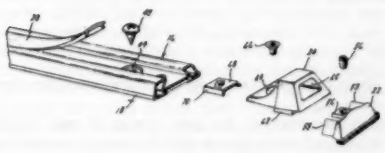
VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 259,898, May 4, 1981. This application Jun. 24, 1983, Ser. No. 507,507

Int. Cl.³ B60R *9/00*

U.S. Cl. 224—321 **8 Claims**



1. In combination with an automotive vehicle having a generally horizontal exterior body surface with a leading edge and a trailing edge of said surface, an article carrier comprising:

a pair of generally horizontally arranged article supporting slats each having a uniform cross-sectional shape, a generally horizontal transverse width greater than the vertical height and both adapted to be directly and fixedly mounted upon the same said horizontal surface of said vehicle presenting a low profile thereon and having a decorative appearance, each said slat having an upwardly opening slot extending longitudinally thereof, said slot being defined in part by a bottom wall and upwardly directed side walls and each said slat having a pair of horizontal supporting surfaces adjacent opposite sides of said slot and capable of having articles supported thereon, said supporting surfaces being cooperable between said slats to be capable of supporting articles on said slats, said surfaces being disposed in the same plane which plane is spaced from the horizontal surface of said vehicle;

article securing means associated with each of said slats, a substantial portion of said article securing means extending upwardly from said horizontal supporting surfaces, a portion of said article securing means disposed within said slot, said article securing means having an operative securing position and having a fastening element extending along an axis arranged generally perpendicular to said supporting surfaces and said vehicle exterior surface;

fastening means disposed at least in part within said slot and including portions adapted to engage the interior of said slot for releasably attaching said article securing means in its operative securing position at a preselected longitudinal position along said slat, said fastening means being operatively connected to said slat such that said fastening means may be threadably advanced in one direction along said axis toward a first position in which said portions of said fastening means engage the interior of said slot in such manner as to clamp said article securing means in said preselected position, and such that said fastening means may be threadedly advanced in the opposite direction along said axis toward a second position in which said article securing means disengages the interior of said slot in such a manner as to unclamp said article securing means and permit the same to be moved longitudinally along said slat; and

end cap means disposed at at least one end of each of said slats closing off said slot to stop the travel of said article securing means in at least one direction at said at least one end of said slat when said fastening means is disposed in said second position in which said article securing means disengages the interior of said slot, said end cap means extending forwardly from each said slat toward the leading edge of said body surface in an aerodynamic and aesthetically appealing manner, each end cap means including a profile extending from a substantially flush profile with the configuration of said slat at the interface between each of said end cap means and each of said slats downwardly to interface with said horizontal body surface.

4,432,479

VEHICLE ATTACHED CARRIER

Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Filed Jun. 22, 1983, Ser. No. 506,815

Int. Cl.³ B60N *11/00*

U.S. Cl. 224—322 **8 Claims**

1. In a vehicle attached carrier for mounting on the roof or trunk lid of a vehicle, the carrier including a load support, a plurality of vehicle engaging devices for supporting the load support on the surface of the vehicle, and carrier attaching means for connecting the load support to the vehicle, the improvement wherein said vehicle engaging devices each include an elongated load distributing member having a pair of relatively parallel pivot pins extending crosswise thereof adjacent opposite ends, means engaging the load distributing member intermediate its ends for attaching the same to the load support in a manner to transmit downwardly applied forces substantially equally to both pivot pins, first and second foot members each having a generally flat vehicle engaging face and a mounting portion extending above the vehicle engaging face, the mounting portions of the first and second foot members each having openings therethrough along a line generally paralleling the associated vehicle engaging face for receiving the respective one of the pivot pins, the openings being enlarged in a direction perpendicular to the vehicle engaging face of the foot member to support the foot members for pivotal movement about the axis of the respective pivot pin and for limited tilting movement in a direction crosswise of the respective pivot pin, whereby to allow the vehicle engaging faces of the first and second foot members to individually conform to

the longitudinal and transverse curvature of the surface of the vehicle contacted thereby.

4,432,480

ROOF ATTACHED ARTICLE CARRIER FOR VEHICLES

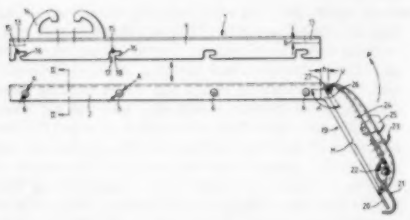
Walter Kimmel, Am Schlossfeld 30, 8950 Kaufbeuren, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,947

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033903

Int. Cl.³ B60R *9/00*

U.S. Cl. 224—329 **9 Claims**



1. A car roof carrier comprising at least one elongated support member, attaching means on the ends of said support member adapted to removably attach said support member at its ends to the car roof so that said support member extends across the roof, at least one elongated retainer carrier having a substantially open-sided channel shaped cross-section formed by a web portion and depending legs therefrom adapted to be removably positioned coextensively over said support member so that said legs extend over at least part of said support member, at least one coupling pin projecting from support member transversely with respect to the longitudinal direction thereof, at least one bayonet slot in a leg of said retainer carrier positioned to engage with said pin having an entrance slot extending from the free edge of said leg to a retaining slot extending substantially parallel to the longitudinal direction of said retainer carrier so that said carrier is attachable to said support member by first moving said carrier with respect to said support member to slide said entrance slot over said pin and then moving said carrier toward one end of said support member into the retaining position where said entrance slot is displaced with respect to said pin to prevent withdrawal of said pin through said slot, and releasable locking means operably mounted on the other end of said support member to engage said carrier in the retaining position to prevent movement thereof toward said other end and to release said carrier to allow movement thereof toward said other end for removing said carrier from said support member.

4,432,481

SPLICE-IN-REGISTER CONTROL

Peter S. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 14, 1982, Ser. No. 388,320

Int. Cl.³ B65H *25/00*

U.S. Cl. 226—9 **13 Claims**

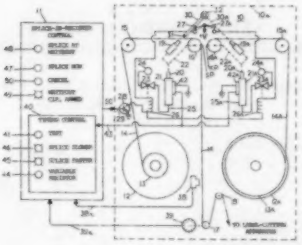
4. A control circuit for a web-feeding machine used to provide a continuous supply of material having successive labels and registration marks printed serially thereon, the machine having an assembly for splicing the material from a ready web and the material severed from a running web wherein the response of the assembly after being actuated is delayed by a response time T, a driving circuit having an input and an output electromechanically coupled to the splicing assembly actuated thereby in response to a signal applied to the input thereof, a scanner positioned adjacent the material to provide a signal in response to the presence of a registration mark, and an encoder for providing a fixed number of pulses proportional to a corresponding length of the moving material, the control circuit comprising:

means responsive to the encoder pulses and to the scanner signals for counting the number of encoder pulses B_o between successive scanner signals to determine the length B of each label, said means being zeroed after each scanner signal;

calculating means connected to said B-counting means and responsive to the encoder pulses and to successive scanner signals for reading the number of encoder pulses B_o in response to each scanner signal and then decrementing from the number B_o to zero in response to successive encoder pulses, said calculating means having a data output providing the decrementing number;

timing means responsive to successive scanner signals for providing a time delay T_o preset to approximate the response time T;

means connected to said timing means and responsive to the encoder pulses and to periodic scanner signals for decrementing to zero from a preset number D correspnding to the distance between the splicing assembly and the scanner in response to successive encoder pulses after the time delay T_o;



means connected to the data output of said calculating means and responsive to said D-counting means for storing a decremented value X provided at the data output of said calculating means when said D-counting means reaches zero;

delay means connected to said X-storing means and responsive to the encoder pulses and successive scanner pulses for reading the value X in response to a scanner signal, decrementing to zero therefrom in response to successive encoder pulses, and providing a splice signal SS upon reaching zero; and

a splicing circuit connected to said delay means, said splicing circuit having an output for providing a splice-command signal SC to the input of the driving circuit and splice-now means for triggering a splice-command signal SC in response to a splice signal SS provided by said delay means after said splice-now means has been armed by an operator, whereby the machine accomplishes a splice-in-register after the splice-command signal SC has been applied.

4,432,482

DISPENSER FOR ROLLED SHEET MATERIAL

Armand S. Beausoleil, 12501 S. Prairie Ave., Hawthorne, Calif. 90250

Filed Apr. 17, 1981, Ser. No. 255,051

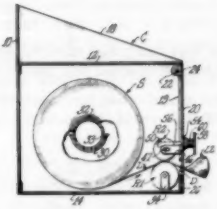
Int. Cl.³ B65H *17/22*; **B65D** *71/00*

U.S. Cl. 226—181 **2 Claims**

1. A sheet dispenser comprising means for rotatably disposing a roll of flexible sheet material therein in position for unrolling, said dispenser having an outlet mouth for emergence therethrough of selected lengths of sheet material as may be drawn from said roll, said mouth including a severance edge extending across the width of sheet material and disposed for

severance of a selected length thereof which has been withdrawn from the mouth,

a first roller carried by the dispenser in position to rollingly support one side of said sheet material adjacent the outlet mouth, a slide track disposed transverse to said outlet mouth, a second roller having an axle slidably supported upon said track for selective displacement therealong between a retracted position wherein the two rollers are spaced apart and an extended position wherein said axle is rotatably disposed adjacent the end of said track with the circumference of the second roller located in frictional contact with the opposite side of said first-roller-supported sheet material and is thus positioned upon its rotation to frictionally impart rolling movement to the first roller by pressure through the intervening sheet material,



thereby moving the intervening sheet through the outlet mouth,

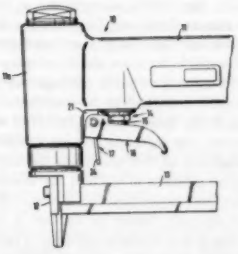
said axle having gear means located intermediate its ends, an ejection starter unit carried by the dispenser adjacent the outlet mouth and comprising a reciprocable plunger adapted selectively to move said second roller along the slide track from retracted to extended position and thereat to drivingly engage said gear means, thereby rotating the two rollers and moving the intervening sheet material through the outlet mouth, said plunger having resilient means for its return to retracted position with disengagement of said gear means and the second roller spaced from the first roller so as to permit the ejected sheet material to be further withdrawn manually and then severed at the severance edge.

4,432,483

SAFETY RELEASE MECHANISM FOR FASTENING DEVICES

Manfred Kuck, Ahrensburg, Fed. Rep. of Germany, assignor to Joh. Friedrich Behrens AG, Ahrensburg, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,583
Int. Cl.³ B21J *7/20*
U.S. Cl. 227—8 **9 Claims**



1. A safety release mechanism for a power operated fastener driving apparatus having a shooting channel for the fastener and a pivotally supported trigger lever housing for actuating a release pin of the driving apparatus, including in combination:

the trigger lever housing comprised of a trigger lever portion having bottom and side portions thereon and defining a channel therein with said bottom portion having a recess therein and wherein said side portions are pivotally attached to the driving apparatus for pivotal movement of said trigger lever into engagement for actuating the release pin,

said safety release mechanism having an actuation portion slidably positioned within said channel and an extension portion extending outwardly from said bottom portion of said trigger lever housing, with said actuation portion having an opening therein,

spring means engageable with said actuation portion to bias the same to an at rest-off position wherein said opening therein and said recess in said bottom of said trigger lever housing are in aligned position to receive the release pin and prevent actuation of the driving apparatus, and

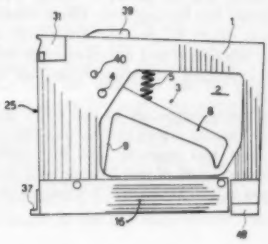
wherein said extension portion of said safety release mechanism is engageable and movable upon the pivotal movement of said trigger lever housing from said at rest-off position to a second position wherein said opening in said actuation portion and said recess in said bottom portion of said trigger lever housing are misaligned to permit engagement of the release pin by the trigger lever housing to energize the driving apparatus.

4,432,484

TOOL FOR DRIVING METAL FASTENERS IN A FRAME AND SETTING ITS REAR CLOSING PANEL

Elio Maestri, Milan, Italy, assignor to Romeo Maestri & Figli S.p.A., Milan, Italy

Filed Dec. 19, 1980, Ser. No. 218,423
Claims priority, application Italy, Dec. 24, 1979, 23473 79[U]; Dec. 24, 1979, 23474 79[U]
Int. Cl.³ B25C *1/02, 5/00*
U.S. Cl. 227—126 **1 Claim**



1. A tool for driving metal fasteners into a frame, comprising:

a casing,

an L-shaped handle having a handle portion and a driving lever portion, said handle being pivotably mounted on and within said casing, said handle being movable between an actuating position and a non-actuating position,

resilient means connected to said casing and said handle, said resilient means being movable to a biased position upon manual movement of said handle from said non-actuating position to said actuating position and further movable to an unbiased position upon release of said handle from said actuating position wherein said handle is biased from said actuating position to said non-actuating position,

said lever portion of said handle forming a recess at the end of said handle,

a catch member mounted in said recess, said catch member being rotatably movable about a pivot in said recess, said catch mechanism having a normal position in said recess,

biasing means positioned in said recess and engaged with

said driving lever and said catch biasing member, said biasing means being for biasing said catch member in said normal position and for allowing movement of said catch member in one direction away from said normal position to a rotated position wherein said biasing means is additionally biased, said recess including a space for receipt of a portion of said catch member in said rotated position,

slidable hammer means positioned in the bottom of said casing, said hammer means being movable between an unbiased position and a baised ejecting position, said hammer means being for receiving said catch member for movement from said unbiased position to said biased ejecting position upon manual movement of said handle toward said actuating position, said catch member being for moving said hammer means from said unbiased position to said biased ejecting position and for releasing said hammer means from said biased ejecting position upon further movement of said handle to said actuating position thereupon releasing said hammer means for biased movement to said unbiased position,

spring means positioned between said casing and said hammer means, said spring means being for moving said hammer from said biased ejecting position to said unbiased position,

a removable loading magazine in said casing containing fasteners in stacked relationship substantially perpendicular to the slidable movement of said hammer means, said loading magazine forming a fastener ejection passage,

means cooperating with said hammer means for ejecting said fasteners from said ejection passage upon movement of said hammer means from said biased ejecting position to said unbiased position;

means for pushing said fasteners downwardly within said magazine toward and to said ejection passage,

a locking lever means pivotably mounted on the upper portion of said casing between the top of said means for pushing and said casing, said locking lever means having a locked mode and an unlocked mode, wherein in said locked mode said locking lever means biasedly urges the top of said means for pushing downwards in said magazine, and wherein in said unlocked mode said top of said means for pushing is released from said locking lever means, and

coil spring means connected to said upper portion of said casing for biasedly urging said locking lever means downwardly over said magazine and for biasedly allowing rotatable movement of said locking lever means upwards away from said magazine and downwards away from said casing.

4,432,485

CORRUTHERM EXPANSION FIXTURE

William E. Smith, Palm Beach County, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

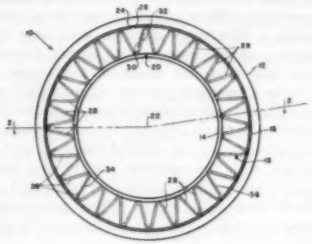
Filed Sep. 21, 1981, Ser. No. 304,122
Int. Cl.³ B23K *19/00*
U.S. Cl. 228—44.1 R **9 Claims**

1. A corrutherm expansion fixture, comprising:

(a) an inner ring;

(b) an outer ring; and

(c) a corrugated ring loosely disposed between said inner and outer rings;



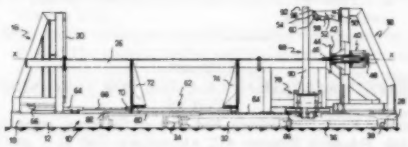
(d) said outer ring being discontinuous and having opposite ends which are positioned adjacent to one another.

4,432,486

DEVICE FOR BRINGING INTO REGISTER THE CIRCULAR END SECTION OF A CYLINDRICAL ELEMENT WITH THE CIRCULAR SECTION OF A CYLINDER BOTTOM, WITH A VIEW TO ASSEMBLY THEREOF BY WELDING

Raymond Wascat, Cuffies by Soissons, France, assignor to Bignier Schmid-Laurent, France

Filed Jan. 21, 1981, Ser. No. 226,606
Claims priority, application France, Jan. 28, 1980, 80 01729
Int. Cl.³ B23K *37/04*
U.S. Cl. 228—49 A **5 Claims**



1. Device for bringing into register the circular end section of a cylindrical element with the circular section of a cylinder bottom, said cylindrical element presenting an axis of revolution and comprising a receiving end adapted to receive the cylinder bottom, the device comprising, a frame defining a track, a stop means fixed on the frame, a bottom-carrying carriage movable on the track, a cylinder-carrying carriage movable on the track between the fixed stop means and the bottom-carrying carriage, and a carriage supporting a radial tightening member adapted to be simultaneously tightened around the receiving end of the cylindrical element and the end of the bottom, the radial tightening member being constituted by an assembly of two half-rings the top ends of which are articulated on a common pin and the lower ends of which are in abutment and supported for movement by means of a roller on an outwardly raised guide, and a jack being connected to the lower end of each half-ring to tighten and loosen same, the carriage supporting the tightening member being movable on the track between the cylinder-carrying carriage and the bottom-carrying carriage.

4,432,487
METHOD OF OVERLAYING STAINLESS STEEL MATERIAL FOR DECORATIVE ARTICLES AND ORNAMENTS WITH A PRECIOUS METAL ALLOY

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki, Kaisha, Japan

Filed Jan. 18, 1982, Ser. No. 340,484

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.³ B23K *20/00*

U.S. Cl. 228—194 **3 Claims**

1. A method of overlaying a stainless steel material for decorative articles and ornaments with an alloy of Au, Pt, and/or Pd bases, which comprises plating selected surfaces of the steel material with the constituents of said alloy in any desired order, and one at a time in a plurality of successive layers, and with each layer being of a thickness and volume corresponding to the constituent ratios of the alloy of a desired purity and dimension, heating the plated layers to a temperature higher than 800° C. for effecting the diffusion bonding thereof, overlaying the plated layers with a layer of said alloy thicker than the combined thicknesses of said plated layers, and heating the resultant product at a temperature lower than 800° C.

4,432,488
ROUND ICE CREAM CARTON

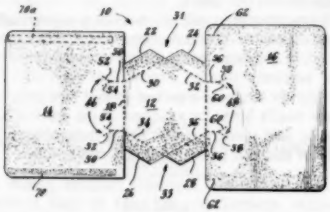
Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 253,010, Apr. 10, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,676

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ B65D *3/04, 3/08*

U.S. Cl. 229—21 **1 Claim**



1. A cylindrically shaped, open-topped carton formed from a unitary sheet of paper stock having a coating of moisture resistant material thereon and having a smooth beaded rim formed by a spinning means comprising:

an essentially flat base having at least three sets of opposed, essentially parallel edges,

a pair of side wall sections each respectively having sides and an end joined by a fold line to one of said base edges and extending upwardly from said base,

first and second pairs of polygonal flap members having four or more straight sides respectively joined by corresponding fold lines to adjacent base edges in said second and third sets thereof, each of said flap members extending upwardly from said base and being joined in face-to-face relationship with interior surface areas of certain of said side wall sections,

at least some of said side wall sections being provided at the ends of said parallel edges of said base with a plurality of Y-shaped pleats, which include a straight vertical leg for engagement with a surface which prevents rotation of the carton with the spinning means at it spins to form said rim bead, said Y-shaped pleats having straight angularly extending arms tending to produce a smooth, substantially unscored and leakfree transition in the shape of said side wall sections from a polygonal shape adjacent said base to an essentially circular shape at the end thereof distal from said base,

a smooth circular bead at said end,

each of said side wall sections being glued on the inside of one of its edges and on the outside of its opposite edge to the other of its side edges whereby the formation of said smooth circular bead is enhanced by the spinning means not having to move against a side edge of said side wall sections but moving downwardly over both of said side edges.

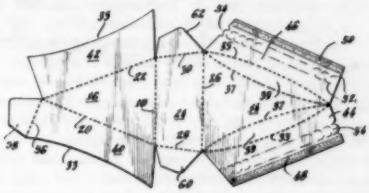
4,432,489
PIE CARTON

Raymond A. Cote, Taylorsville, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 14, 1982, Ser. No. 388,499

Int. Cl.³ B65D *5/54, 85/36*

U.S. Cl. 229—22 **4 Claims**



1. A one-piece foldable blank for forming a wedge-shaped carton having a slanted end wall, said carton comprising:

a triangular bottom panel having a base edge and two side edges;

a trapezoidal end wall having top, bottom and side edges, with said bottom edge of said end wall and said base edge of said bottom panel being hingedly connected and of equal length, and with corner flaps being respectively connected to the side edges of said trapezoidal end wall;

a triangular top panel having a base edge and two side edges with the length of the base edge of said top panel being greater than the length of the base edge of said bottom panel, and with the length of said top panel measured along an imaginary line extending perpendicularly from the associated base edge to the opposed apex thereof being greater than the length of said bottom panel measured along an imaginary line extending perpendicularly from the associated base edge to the opposed apex thereof, said base edge of said top panel being hingedly connected and of equal length to the top edge of said trapezoidal end wall;

a pair of side wall panels extending from and hingedly connected to the associated side edges of said triangular top and bottom panels, with each side panel of one pair of said side wall panels including a pair of spaced, intermittent cut lines extending along the length thereof and defining a tear strip to permit easy opening of the erected carton which is of wedge-shaped configuration having a slanted trapezoidal end wall and which is useful for containing a wedge-shaped piece of pie having a slanted crust portion, with the carton conforming to the shape of said pie piece and with said sloping trapezoidal end wall functioning to provide increased protection and support to the slanted crust portion thereof,

said base edge of said top panel being defined by at least a pair of spaced scorelines converging towards each other at their ends to enhance the protection of a pie piece within said carton by precluding contact of the pie piece with an adjacent straight edge, a fold around flap is hingedly connected to the edge of one side wall panel extending from said bottom panel, said fold around flap being disposed adjacent the apex of said triangular bottom

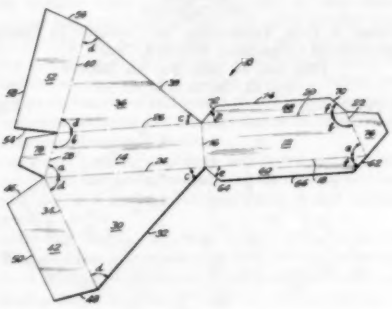
panel, said converging scorelines defining said edge including a convex and facing concave scoreline.

4,432,490

REAR LOADING SINGLE SERVING PIE CONTAINER AND BLANK FOR FORMING SAME

Harry H. Roberts, Roswell, Ga., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 25, 1982, Ser. No. 411,438
Int. Cl.³ B65D 5/00
U.S. Cl. 229—22 **7 Claims**



1. A paperboard blank for forming a wedge-shaped pie carton having an openable slanted rear wall, said blank comprising:

first and second substantially identical trapezoidal side wall panels, each said side wall panel including parallel top and bottom edges and non-parallel first and second side edges, the top edges of said side wall panels being longer than the bottom edges thereof, the first side edges of said side wall panels being a common edge perpendicular to the top and bottom edges thereof, said side wall panels being foldably connected along said common edge such that the top and bottom edges of the first side wall panel are colinear respectively with the top and bottom edges of the second side wall panel;

an isosceles triangular top panel having first and second equal side edges and a base edge, said first side edge of said top panel and the top edge of one said side wall panel being a common edge hingedly connected and of equal length, said first and second side edges of said top panel intersecting one another adjacent the foldable connection of said first and second side wall panels;

an isosceles triangular bottom panel having first and second equal side edges and a base edge, said first side edge of said top panel and the bottom edge of one said side wall panel being a common edge hingedly connected and of equal length, said first and second side edges of said top panel intersecting one another adjacent the foldable connection of said first and second side wall panels, the angular separation of said first and second side edges of said bottom panel being equal to the angular separation between the first and second side edges of the top panel;

an isosceles trapezoidal top panel flap having parallel top and bottom edges and non-parallel side edges, said top edge of said top panel flap and said base edge of said top panel being a common edge hingedly connected and of equal length, said bottom edge of said top panel flap and said base edge of said bottom panel being of equal length, said side edges of said top panel flap and the second side edges of said side wall panels being of equal length; and

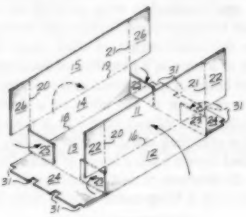
an isosceles trapezoidal bottom panel flap substantially identical to said top panel flap, said bottom panel flap having parallel top and bottom edges and non-parallel side edges, said bottom edge of said bottom panel flap and said base edge of said bottom panel being a common edge hingedly connected and of equal length.

4,432,491

CONTAINER PACKAGING FOR CUPS

Herbert D. Muise, Orange, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 21, 1982, Ser. No. 390,713
Int. Cl.³ B65D 5/22, 5/42
U.S. Cl. 229—33 **6 Claims**



1. A container for packaging cups comprising

side panels,

a bottom closure,

end panels extending between said side panels,

notches in the upper edges of said end panels to accommodate rails holding said cups, said notches in one end panel being aligned with said notches in the other end panel,

two of said notches in each end panel being at the upper corners of said end panel, the remainder of said notches in each end panel being located equidistantly across the top edge of said end panel,

the distance between said notches being substantially greater than the width of said notches,

said notches having a width which allows said rails to fit into said notches,

cover panels hingedly attached to said side panels,

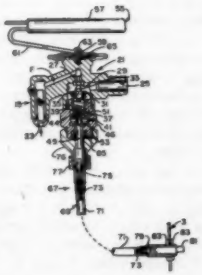
closure panels hingedly attached to the sides of said cover panels, said closure panels being fastenable to the outer face of said end panels covering said notches.

4,432,492

THERMOSTATIC EXPANSION VALVE WITH REMOTE ADJUSTMENT

Bernard L. Kunz, Madison County, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 136,442, Apr. 2, 1980, Pat. No. 4,325,508. This application Feb. 19, 1982, Ser. No. 350,226
Int. Cl.³ F25B 41/04
U.S. Cl. 236—92 B **6 Claims**



1. In a thermostatic expansion valve for a refrigeration sys-

tem, said valve comprising a a valve housing having a flow path therethrough, said flow path having an inlet, an outlet, and an expansion valve seat constituting a expansion port between said inlet and said outlet, said inlet and said outlet being adapted to be connected to a liquid line of the refrigeration system for the passage therethrough of pressurized refrigerant, a valve member movable toward and away from said valve seat thereby to regulate the flow of refrigerant through said flow path, a compression coil spring for biasing said valve member toward a closed position in which said valve member cooperates with said valve seat thereby to regulate the flow of refrigerant through said flow path, expansion bulb and diaphragm means operatively connected to said valve member responsive to the load on said refrigeration system, said expansion bulb and diaphragm means and said spring operating on said valve member so as to maintain the flow of refrigerant through said flow path within a desired superheat range, and means for adjusting the superheat range of the thermal expansion valve, this last-said adjustment means comprising a spring compression member engageable with one end of said spring and being selectively axially movable relative to said spring thereby to compress or relax said spring throughout a predetermined range and thereby to vary the superheat range of said thermostatic expansion valve, wherein the improvement comprises: an adjustment stem rotatable with respect to said valve housing and having a flange engageable with said valve housing so as to prevent axial movement of said stem, said adjustment stem being threadably engageable with said spring compression member and being rotatable through a plurality of revolutions thereby to effect axial movement of said spring compression member throughout said predetermined range upon rotation of said ajustment stem, an elongate flexible shaft, one end of said flexible shaft being coupled to said adjustment stem, means for sealing said adjustment stem with respect to said housing and for permitting rotation of said adjustment means relative to said housing, said flexible shaft having a drive member on its outer end and being unaffected by the compression force of said spring, rotation of said drive member effecting corresponding rotation of said adjustment stem relative to said valve housing thereby permitting convenient adjustment of the superheat range of said thermal expansion valve from a location remote from said thermal expansion valve.

4,432,493

SYSTEM FOR HEATING THE SERVICE CABIN OF A MACHINE

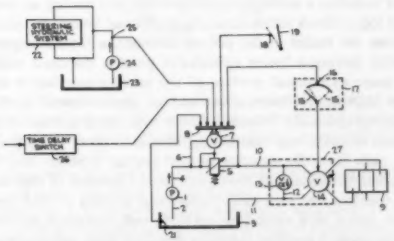
Gottfried Moser, Bergisch Gladbach, and Hansjurgen Gross, Niederkassel, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,254

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033661

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 R **8 Claims**



1. A system for heating the service cabin of a machine powered by an internal combustion engine having an oil sump containing lubricating oil, and a lubricating oil distribution circuit, the system comprising a hydraulic pump, a heat exchanger located in the service cabin or in a hot-air supply line thereof, heat generating means connected between said pump and said heat exchanger in said oil circuit of the internal combustion engine, said circuit having suction and return oil lines respectively extending from said pump and said heat exchanger to said oil sump of the engine, a first line in said circuit by-passing said means and being controlled by a directional control valve, and a second line in said circuit by-passing said heat exchanger and being controlled by a control mechanism, the improvement wherein said heat generating means comprises a pressure relief valve which is mechanically fixed to effect a constant opening pressure, said control mechanism comprises an adjustable flow control valve for regulating oil flow, means for manually adjusting said control valve for regulating said heat exchanger, said directional control valve having a control element, said manually adjusting means including a first actuating switch for activating said control element for opening said directional control valve, and means responsive to the temperature of the oil for activating said control element, independent of said manually adjusting means, for opening said directional control valve above a predetermined lubricating oil temperature required for operation of said engine to make available to said heat exchanger the waste heat of said oil upon regulation of said heat exchanger, said temperature responsive means being set for opening said directional control valve above said predetermined temperature, and said temperature responsive means being set for activating said control element for closing said directional control valve below said predetermined temperature required for engine operation so that the lubricating oil in said distribution circuit may be heated by said fixed pressure relief valve as required for the operation of said engine irrespective of whether heat is required for said heat exchanger.

4,432,494

SELF-STEERABLE WHEEL ASSEMBLY FOR IRRIGATION SYSTEMS

Richard E. Hunter, 5755 Arrowhead Dr., Greeley, Colo. 80631

Filed Mar. 13, 1981, Ser. No. 243,437

Int. Cl.³ B05B *3/18*

U.S. Cl. 239—177 CC **15 Claims**

13. In a self-propelled irrigating apparatus of the center pivot type in which an elongated water supply conduit is supported by a plurality of spaced, wheeled support towers and means are provided for advancing said wheeled support towers in a circular path across an area to be irrigated, the boundary of the area being unevenly spaced away from the center, the improvement comprising:

an extension boom member hinged at the outermost end support tower of said wheeled support towers and at a point inwardly of the outer distal end of said extension boom member;

a castored wheel support assembly disposed intermediately between said outermost end support tower and said outer distal end of said extension boom member having a suspension frame connected to said extension boom member, a pair of laterally offset, steerable ground-engaging wheels arranged in tandem, suspension means for journaled connection of said wheels to said suspension frame whereby to suspend said wheels in trailing, laterally offset relation

to the vertical axis of journaled connection to said suspension frame; and

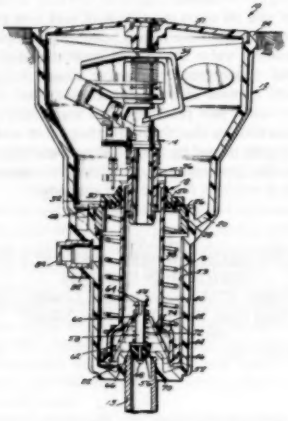
drive means associated with at least one of said steerable wheels for advancing said wheels independently of and at a rate faster than the rate of advancement of said propelling means for said wheeled support towers, sensing means in outer surrounding relation to said extension boom member operative to sense the boundary of the area to be irrigated, and said drive means responsive to said sensing means to control the rate of advancement of said steerable wheels relative to the rate of advancement of said wheeled support towers.

4,432,495

POP-UP SPRINKLER WITH INDEPENDENTLY BIASED DRAIN VALVE

Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed May 10, 1982, Ser. No. 376,496
Int. Cl.³ B05B *15/10*
U.S. Cl. 239—205 **8 Claims**



1. In a pop-up sprinkler comprising a housing assembly adapted to be stationarily mounted in the ground having an inlet in the lower portion thereof adapted to be communicated with a source of water under pressure, a sprinkler head assembly carried by said housing assembly for movement from a retracted storage position into an extended opertive position in response to the communication of said water source with said housing assembly, and coil spring means between said housing assembly and said sprinkler head assembly for resiliently urging said sprinkler head assembly into said retracted storage position in response to the closing of communication of said water source with said housing assembly, the improvement which comprises

an upwardly facing annular valve seat formed in the lower portion of said housing assembly above said inlet therein,

a valve member carried by said sprinkler head assembly in a position to engage said annular valve seat when said sprinkler head assembly is in said retracted storage position, and

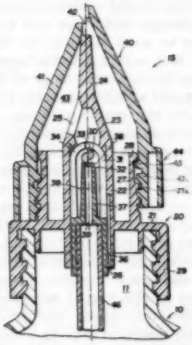
means mounting said valve member on said sprinkler head assembly for biased movement independent of the movement of said sprinkler head assembly and independent of the resilient urging of said coil spring means so that said valve member will be separately moved out of engagement with said annular valve seat prior to the movement of the sprinkler head assembly out of said retracted storage position so as to permit passage of water under pressure into said housing assembly in response to the communication of the source of water under pressure with said inlet.

4,432,496

FOAM LIQUID DISPENSING DEVICE

Kazuo Ito, Kamakura, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,688
Int. Cl.³ B65D *1/32*
U.S. Cl. 239—327 **13 Claims**



1. In a foam liquid dispensing device adapted to mix liquid capable of foaming and air together and dispense said mixture as foam liquid, characterized by a cylindrical container having a neck provided on the outer periphery of the neck with threads; a cap adapted to be detachably fitted on said container and including an outer cover having an upwardly tapered upper portion provided at the upper end with a foam liquid jet nozzle and an integral lower cylindrical skirt provided on the inner periphery with threads and a coaxial inner cover having a lower cylindrical skirt, an outer cylindrical portion extending upwardly from said skirt of the inner cover and an integral inner cylindrical portion extending upwardly and downwardly through said skirt of the inner cover and surrounded by said outer cylindrical portion in peripherally spaced relationship to the latter, said inner cylindrical portion integrally having a frusto-conical portion extending upwardly from said inner cylindrical portion and provided with a discharge port and a plug extending upwardly from said frusto-conical portion and adapted to clog said jet nozzle whereby the upwardly tapered portion of said outer cover and said inner cover define a flow path therebetween in communication with said discharge port, a cylindrical porous member disposed within said inner cylindrical portion of the inner cover above said skirt of the inner cover to define a mixing chamber therein and having an outlet at the top, a check valve normally positioned below said outlet to close the outlet in the porous member, a tubular support member having a lower cylindrical portion disposed within said inner cylindrical portion of the inner cover below said lower skirt of the inner cover and an upper tapered portion extending upwardly from said lower cylindrical portion of the support member into said mixing chamber, there being a side flow path from the exterior of said porous member into the container between said lower cylindrical portion of said support member and said inner cylindrical portion of said inner cover, and a pipe extending between said container and said tubular support member whereby one fluid from said container flows through said support member into said mixing chamber and the other fluid from said container flows through said side flow path and pores in said porous member into the mixing chamber to mix with said one fluid.

4,432,497
NOZZLE FOR FORMING A FREE JET STREAM OF A LIQUID, AND ITS METHOD OF MANUFACTURE

Ludger Wöste, Chexbres-Vaud, Switzerland, assignor to Lexel Corporation, Palo Alto, Calif.

Filed May 21, 1981, Ser. No. 265,700
Int. Cl.³ B05B *1/00*
U.S. Cl. 239—589 12 Claims

1. A nozzle for receiving a liquid under pressure and forming a free jet stream therefrom and having an exit aperture at least partially formed by an edge of a first block of material defined by the intersection of first and second faces of said block, conditioned to having a minimum of imperfections by:

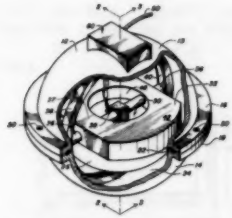
a. positioning said first block against a support block with said first face thereof generally coplanar with a corresponding first face of said supporting block and said edge in contact with said supporting block; and

b. simultaneously removing material from said first face of said block and said corresponding first face of said supporting block while overlapping said edge whereby said edge is fully supporting during said removal.

4,432,498
METHOD AND APPARATUS FOR DISPOSING OF ANIMAL WASTE

Aynon L. Clements, 7165 N. Oakbank Dr., Glendora, Calif. 91740

Filed Jul. 16, 1979, Ser. No. 57,884
Int. Cl.³ B02C *23/18*
U.S. Cl. 241—21 9 Claims



1. That method of hydraulically processing animal waste including straw and the like bedding material and conducting the same to a place of disposal in finely comminuted form which consists of:

submerging the animal waste and bedding material in a body of water confined in a container;

injecting a jet of pressurized water into said body of water from a stationary nozzle near the bottom of said container in a manner to rotate a major portion of said water, and said animal waste and bedding material in the path of said jet and comminuting the same into smaller increments; and

simultaneously circulating another stream of said pressurized water through aspirating duct means having a submerged inlet port to aspirate the comminuted animal waste, bedding material and water from said body of water into said duct means and conducting the same to a place of disposal.

7. Apparatus for hydraulically conducting animal waste and bedding material associated therewith to a place of disposal comprising:

elongated duct means having an inlet at one end connectable to a source of pressurized water and an outlet at the other end thereof;

said duct means including a second duct having an inlet for animal waste and bedding material adapted to be submerged near the bottom of a container of water, animal waste and bedding material and having an outlet opening into said duct means between the said inlet and outlet of said duct means;

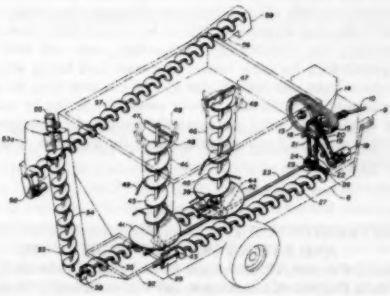
means interiorly of said duct means for jetting water from said water inlet past said outlet of said second duct thereby to aspirate said animal waste and bedding material into said duct means; and

said duct means including a third duct having stationary nozzle means for jetting a stream of pressurized water past the exterior of said inlet for animal waste and bedding material and effective to circulate major portions thereof past said animal waste and bedding material inlet as other portions of said animal waste and bedding material are aspirated thereinto.

4,432,499
PORTABLE FEED GRINDER-MIXER

Larry L. Henkensiefken, Waseca; Douglas L. Pettit, and Gerald E. Barry, both of Owatonna, all of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Dec. 15, 1980, Ser. No. 216,134
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—30 28 Claims



1. A feed grinder-mixer comprising:

(a) a vehicle;

(b) feed grinding mechanism mounted on said vehicle;

(c) a mixing bin carried by said vehicle and connected to said feed grinding mechanism in ground feed-receiving relation;

(d) first power-driven mixing mechanism in communication with the interior of said bin and constructed and arranged to move and mix such ground feed in a circulatory path in a generally horizontal plane;

(e) second power-driven mixing mechanism mounted within said bin directly above and in close ground-feed-receiving relation with said first mixing mechanism and being constructed and arranged immediately above said first mechanism in close proximity thereto so as to move, mix and cross-mix such ground feed in a circulatory path in a generally vertical plane, which path intersects said horizontal circulatory path;

(f) power-driven unloading mechanism connected to said bin in ground-feed-receiving relation for conveying the ground-feed away therefrom after it has been so mixed by said mixing mechanisms.

4,432,500

ROLL MILL FOR MILLING COAL

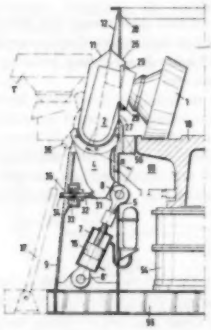
Horst Brundiek, Kaarst, and Ludwig Werner, Düsseldorf, both of Fed. Rep. of Germany, assignors to Loesche GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,299

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100341

Int. Cl.³ B02C *15/00*

U.S. Cl. 241—57 **7 Claims**



1. In a roll mill having a gas-tight housing, a mill pan, a system for driving the pan about an upright axis, rolls designed for rolling and milling material on said pan supplied to said mill, and turnpins with rocker arms, equal in number to the number of rolls, each rocker arm turningly supporting one of said rolls, said arms being able to be rocked about axes of said turnpins, the improvement comprising said roll mill has a separate fork for each rocker arm, said fork being able to be undone from said rocker arm so that the arm may be moved separately from the fork, power means for acting on said rolls by way of said forks, and gas-tight covers placed around said rocker arms, said covers furthermore forming part of said mill housing.

4,432,501

APPARATUS FOR THE CONTINUOUS PRODUCTION AND LAYING DOWN OF YARN LOOPS

Gerhard Arendt, Hohentengen; Roland Benz, Denkendorf; Reinhold Engenhart, Blochingen, and Viktor Schmidt, Saulgau, all of Fed. Rep. of Germany, assignors to Lucke Apparate-Bau GmbH, Mengen, Fed. Rep. of Germany

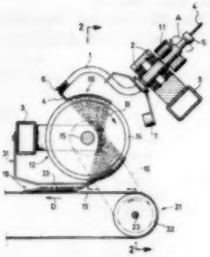
Filed Apr. 6, 1982, Ser. No. 365,998

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114535

Int. Cl.³ B65H *54/76*

U.S. Cl. 242—47 **6 Claims**

1. Apparatus for the continuous production and laying down of yarn loops including in combination a rotationally symmetrical lap body comprising a shaft, a pair of loop carriers and means adjustably mounting said carriers in spaced relationship on said shaft, means mounting said shaft for rotary movement around a first axis corresponding to the axis of symmetry of said body, a belt conveyor for receiving loops from said body, means mounting said conveyor for movement of the loop receiving length thereof in a certain direction, a lap flyer for introducing yarn loops onto said lap body, means mounting said lap flyer for rotary movement around a second axis, the arrangement being such that said first axis extends transversely both to said second axis and said certain direction, means for driving said lap body so that the portion thereof adjacent to said conveyor moves generally in said certain direction, and a



stationary loop stripper extending into the space between the loop carriers for transferring loops from said lap body to said belt conveyor.

4,432,502

BOBBIN APPARATUS FOR USE IN RADIOSONDES

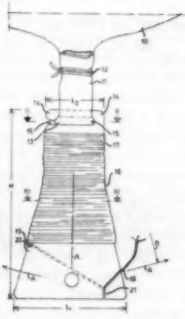
Esa Varkia, and Osmo Reittu, both of Espoo, Finland, assignors to Vaisala Oy, Finland

Filed Jul. 1, 1981, Ser. No. 279,512

Claims priority, application Finland, Jul. 2, 1980, 802130

Int. Cl.³ B65H *54/68*

U.S. Cl. 242—50 **9 Claims**

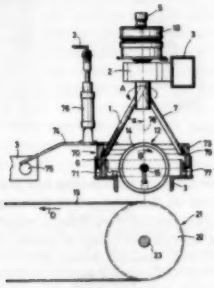


1. Bobbin apparatus for releasing a filament which interconnects a radiosonde and a sonde balloon in a controlled manner during the ascent thereof, comprising a bobbin member adapted to be affixed to the balloon having a longitudinal axis around which the filament is adapted to be wound and a transverse dimension which increases in the longitudinal direction from a narrow upper end to a wide lower end thereof, said bobbin member having a configuration which causes it to oscillate below said balloon periodically to and fro as said balloon ascends and said filament unwinds from said bobbin member whereby said filament unwinds from said bobbin member in a controlled manner without fouling and at an appropriate rate.

4,432,503
MACHINE FOR PRODUCING YARN LOOPS

Klaus Wedler, Mittelbiberach, Fed. Rep. of Germany, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG., Mengen, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,484
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202474
Int. Cl.³ B65H *51/20*
U.S. Cl. 242—47 14 Claims

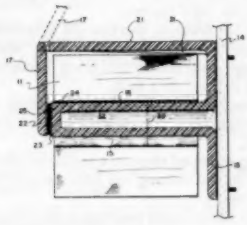


1. Apparatus for producing yarn loops comprising a rotary winding member having a discharge end through which, in use, yarn passes; a winding means for collecting yarn discharged from said winding member in the form of loops; a conveyor means for receiving loops of yarn from said winding means and conveying the loops received from the winding means to a remote position; and clamping means for the end of the yarn as it emerges from the discharge end of the winding member during the initial use of the apparatus, said clamping means including a pair of rings surrounding said winding means, said rings defining complementary surfaces the contours of which substantially correspond to the path of movement of the discharge end of the winding member, and means for moving the rings relative to each other so that the end of the yarn emerging from said discharge end can be trapped between said surfaces.

4,432,504
HOLDER AND DISPENSER FOR BATHROOM TISSUE ROLLS

Ron L. Pace, 217 S. 2nd West, Wellsville, Utah 84339

Filed Mar. 2, 1981, Ser. No. 239,396
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.2 5 Claims



1. An apparatus adapted for holding and dispensing bathroom tissue from a roll of a strip thereof, said roll enclosing a central tubular core therethrough normal to the strip, and said apparatus comprising:

a wall mounting plate adapted to be secured with a flat wall side thereof against the surface of a bathroom wall;

a cylindrical spindle being integral with the wall mounting plate and outstanding normally therefrom away from the wall, said spindle being of substantially smaller outside diameter than the inside diameter of the central tubular core of the roll, and being outstanding from the plate at least a distance slightly greater than the width of the roll;

a hinge member being integral with the wall mounting plate and outstanding normally therefrom away from the wall, and outstanding from the plate a distance at least slightly greater than the width of the roll, and spaced away from the spindle a distance sufficient to clear a roll placed thereabout;

a roll retaining member spanning between the ends of the spindle and the hinge member remote from the wall plate;

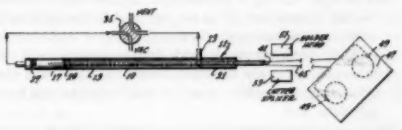
hinge means connecting said end of the hinge member with the end of the roll retaining member proximate thereto, said hinge means permitting the retaining member to be rotated away from the spindle to permit placement and removal of the roll to about and from about the spindle respectively; and

means for releasably securing the spindle end of the roll retaining member to said end of the spindle.

4,432,505
LEAD TAPE PULLER AND METHOD

Edward W. Honeywell, 1237 S. Ninth Ave., Arcadia, Calif. 91006, and Joseph C. Honeywell, R.R. 2, Box 1006, Sand Spring, Okla. 74063

Filed Jan. 18, 1982, Ser. No. 340,315
Int. Cl.³ B65H *69/06*; G03D *15/04*
U.S. Cl. 242—56 R 17 Claims



1. A method of moving a movable element comprising:

providing a moving apparatus which includes a housing, a passage in the housing, a piston slidable in the passage of the housing, a member coupled to said piston and movable with said piston between extended and retracted positions and passage means in said piston and said member opening on one side of said piston and having a port in the member which provides communication between the interior of the passage means and the exterior of the member on the other side of the piston;

moving said piston and said member to one of said positions with the port being adjacent the movable element;

applying subatmospheric pressure to said one side of the piston and through said passage means to tend to draw air through the port and the passage means to said one side of the piston and to tend to pull the movable element toward said port;

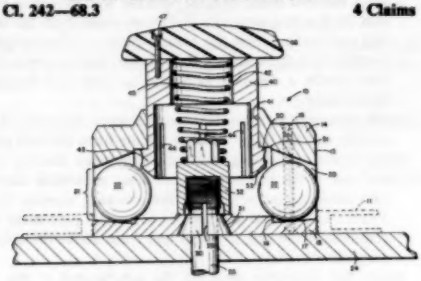
at least partially closing said passage means with said movable element to restrict air flow through said passage means to said one side of said piston to thereby reduce the pressure on said one side of the piston; and

applying a pressure greater than said subatmospheric pressure to said other side of the piston whereby said subatmospheric pressure and said pressure greater than said subatmospheric pressure create a differential pressure across the piston to at least assist in moving the piston and the member to the other of said positions.

4,432,506
REEL AND HUB LOCK FOR TAPE DRIVES

Barrett P. Bingaman, Burbank, Calif., assignor to Cetec Corporation, El Monte, Calif.

Filed Jul. 28, 1982, Ser. No. 402,773
Int. Cl.³ B23B 31/14; B65H 17/02
U.S. Cl. 242—68.3 **4 Claims**



1. In a reel and hub locking mechanism for a tape drive, the combination of:

a subplate;

a ball housing positioned over said subplate and having a plurality of radial passages, with each of said passages having a converging taper in the outward direction;

a ball positioned in each of said passages for radial movement, with the peripheral opening of the passage of a size smaller than the ball to retain the ball in the passage;

means for mounting said subplate and ball housing on a drive shaft; and

a plunger mounted in said housing for axial sliding between locking and non-locking positions,

said plunger having a plurality of flexible fingers having an overall dimension (a) to engage and force said balls outward in said passages when said plunger is moved to said locking position, with said fingers individually flexing inwardly to apply outward forces on said balls thereby centering and locking a reel or hub between said balls and subplate, and

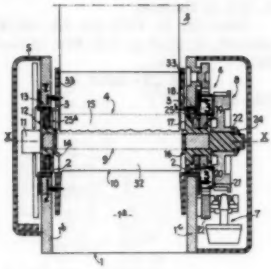
(b) to be spaced from said balls when said plunger is moved to said non-locking position a distance permitting said balls to move inward in said passages to clear a reel or hub, with said balls moving radially freely in said passages so that rotation of said mechanisms produces forces moving said balls radially outward thereby centering and locking a reel or hub between said balls and subplate.

4,432,507
RETRACTOR FOR A SAFETY STRAP

Maurice Rietsch, Valentigney, and Jean Joly, Pont de Roide, both of France, assignors to Aciers et Outillage Peugeot, Audincourt, France

Filed Apr. 15, 1983, Ser. No. 485,359
Claims priority, application France, Apr. 26, 1982, 82 07133
Int. Cl.³ A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 A **8 Claims**

1. In a retractor for a safety strap of the type comprising a support, a rigid central assembly which is for connection to one end of the strap, is mounted in the support to rotate about an axis and around which assembly the strap is adapted to be wound under the action of a resiliently yieldable return force, a locking mechanism associated with said assembly for preventing the rotation of said assembly in the direction for unwinding the strap when a limit acceleration or deceleration value applied to the strap and/or to the support is exceeded, said assembly comprising as a central core a metal strip and a covering of moulded plastics material in which covering the strip is fastened, said covering having portions defining two coaxial bearing surfaces by means of which bearing surfaces the assembly is rotatively mounted in the support; the improvement comprising adjacent to each end of said rigid assembly a rigid reinforcing circular plate which is perpendicular to the

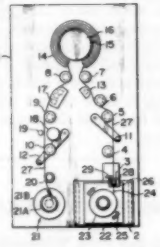


strip and engaged on a corresponding end portion of the metal strip in the region of the respective bearing surface of said assembly, each plate having a periphery which is covered only with a thin layer of said covering of plastics material.

4,432,508
AUTOMATIC TAPE THREADING DEVICE

Yoichi Inoue; Takao Terayama, both of Ibaraki; Susumu Kasai, Sagamihara, and Tamotsu Tominaga, Akishima, all of Japan, assignors to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,657
Claims priority, application Japan, Jan. 14, 1981, 56-3216
Int. Cl.³ G11B 15/66
U.S. Cl. 242—195 **6 Claims**



1. An automatic tape threading device suitable for use with a magnetic recording and reproducing system, comprising:

a cartridge having mounted therein a supply reel for winding a magnetic tape thereon;

a takeup reel for winding thereon the magnetic tape and a leading tape member having a greater width than the magnetic tape, said takeup reel being connected to a drive source and located on a base;

a cartridge stage for attaching said cartridge thereto, said cartridge stage being mounted on a base laterally of said takeup reel;

a drum having mounted thereon a magnetic head for writing informtion to and reading out information from the magnetic tape; and

an eraser head and a sound head mounted in a path of travel of the magnetic tape;

said leading tape member being connectable to said magnetic tape so that the magnetic tape moves past an outer circumferential surface of said drum as the leading tape member is taken up on the takeup reel;

wherein the improvement comprises:

a support means for shifting the cartridge stage in a direction toward and away from a reel bed on said base in such a

manner that a surface of rotation of the supply reel of a cartridge attached to the cartridge stage moves in a direction perpendicular to the surface of the base;

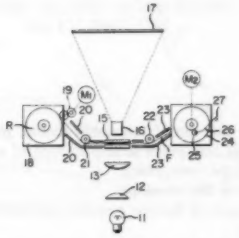
a pair of complementary shaped male and female joint members, one of said joint members being located at an end portion of the leading tape member withdrawn from the takeup reel and moved along the path of travel of the magnetic tape to the vicinity of the cartridge stage and the other of the joint members being located at an end portion of the magnetic tape wound on the supply reel in the cartridge attached to the cartridge stage, said joint member located on the end portion of the leading tape member being constructed and arranged to come into engagement with said joint member on the end portion of the magnetic tape by widthwise movement therebetween, whereby the joint member of the magnetic tape and the joint member of the leading tape member are brought into interfitting engagement with each other as the supply reel of the cartridge is engaged with said reel bed due to shifting of said cartridge stage by said support means.

4,432,509

APPARATUS FOR FEEDING FILM

Masanari Shirai, Chigasaki, and Hitoshi Yanagawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,903
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—195 **6 Claims**



6. An apparatus for automatically loading a sheet at a predetermined position from a reel on which the sheet is wound, wherein the sheet has a leader part affixed to the leading end of a part of the sheet on which an information is recorded with the leader part having a width larger than that of the information recorded part, said apparatus comprising:

a reel having a core and having a pair of flanges provided on the core spacing apart from each other by a distanced which is smaller than the width of the leader part but larger than the width of the information recorded part, the information recorded part being wound around the core and the leader part being wound around the peripheral surface of the pair of flanges;

a roller having a width smaller than the distance between the pair of flanges and movable between a first position spaced from the peripheral surface of the pair of flanges and a second position located between the inner walls of the pair of flanges;

driving means for rotating said roller to provide an automatic loading operation;

means for guiding the sheet fed out from said reel to the predetermined position;

means for moving said roller, during the automatic loading operation, from the first position to a position where said roller press-contacts the leader part wound around the peripheral surface of the pair of flanges, and then for moving said roller, when the leader part is completely fed out and spaced from the peripheral surface of the pair of flanges, from the press-contacts position to the second position;

detecting means for outputting a signal when said roller moves to the second position;

means for moving said roller to the first position in response to the output of said detecting means; and

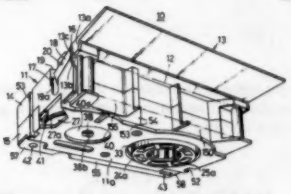
means disposed at the predetermined position for taking up the sheet fed from said reel.

4,432,510

TAPE CASSETTE

Haruki Ogata, Sagamihara; Kimio Ogawa, and Hiroyuki Umeda, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 15, 1982, Ser. No. 339,671
Claims priority, application Japan, Jan. 20, 1981, 56-7566
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—200 **11 Claims**



1. A tape cassette for use with a recording and/or reproducing apparatus having a reel driving mechanism including at least one reel driving shaft, said tape cassette comprising:

a cassette case;

a supply reel and a take-up reel provided within said cassette case, for winding a tape, and positioning means for positioning said cassette case with respect to the recording and/or reproducing apparatus;

one of said reels being constructed to receive the reel driving shaft of said recording and/or reproducing apparatus, said shaft being inserted into a center part of the bottom of said one reel to engage and drive said one reel when said tape cassette is loaded into said recording and/or reproducing apparatus;

the other of said reels being constructed so as to be driven at other than a center part thereof;

said positioning means having an engaging part on the bottom surface of said cassette case at a position corresponding to the center of rotation of said other reel.

4,432,511

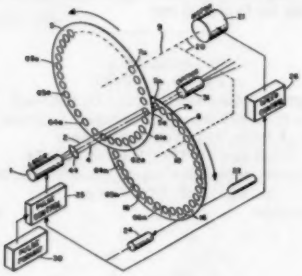
BEAM-RIDER GUIDANCE USING TWO OVERLAPPING RETICLE DISCS

Kay C. Tong, Mission Viejo, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed May 11, 1981, Ser. No. 262,684
Int. Cl.³ F41G *7/26*
U.S. Cl. 244—3.13 **18 Claims**

1. Beam rider guidance apparatus for a guided object, comprising a light beam generator for projecting a light beam toward a target and onto said object when the latter is launched at said target, a pair of rotating reticle discs in the path of said beam, each of said discs having a series of reticles thereon in a circle centered at the axis of rotation of said disc, one of said discs being an elevation guidance disc having its reticles passing in a vertical direction through said path of said beam, the second disc being an azimuth guidance disc having its reticles passing in a horizontal direction through said beam path, each of said series of reticles comprising a plurality of clear reticles and a plurality of guidance reticles having a light-blocking portion and a light-passing portion wherein said portions are at different positions in each of said guidance reticles to form an advancing pattern circumferentially of its respective disc as said disc is rotated, and means for connecting

and driving said discs in a synchronous manner to project said beam through a guidance reticle on said elevation disc and simultaneously through a clear reticle on said azimuth disc, and



at different times in said rotation through a clear reticle on said elevation disc and simultaneously through a guidance reticle on said azimuth disc.

4,432,512

JET PROPULSION EFFLUX OUTLETS

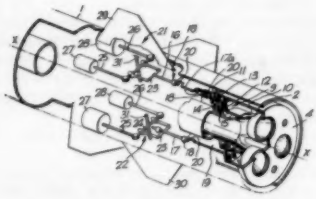
Robert W. Young, Luton, England, assignor to British Aerospace Public Limited Company, London, England

Filed Aug. 27, 1979, Ser. No. 69,713

Claims priority, application United Kingdom, Aug. 31, 1978, 35153/78

Int. Cl.³ F42B *15/18*

U.S. Cl. 244—3.22 **10 Claims**



1. A jet propulsion efflux outlet assembly for controlling a guided flight vehicle in opposed senses about at least its roll axis while in flight comprising in combination;

nozzle means defining a plurality of aperture means through which efflux issues to exert a propulsive thurst, the plurality of aperture means being symmetrically disposed about the roll axis and shaped so that at least one edge region of each aperture means is radially spaced further from the roll axis than other edge regions of the same aperture means;

a spoiler plate member defining a plurality of aperture means matching in both number and configuration said plurality of aperture means of said nozzle means, each aperture means of said spoiler plate member having an impingement region on which the issuing efflux can impinge;

support means for supporting said spoiler plate member in a position generally transverse to the roll axis adjacent but downstream of said nozzle means and allowing movement of said spoiler plate member in the form of rotation in the roll sense; and

actuating means operable in flight to turn said spoiler plate member in opposed roll senses, such that efflux issuing from a part of each aperture means remote from the roll axis impinges on an associated impingement region and causes a roll torque of magnitude and sense dependent on the respective magnitude and sense of movement of said spoiler plate member.

4,432,513

GAS-PROOF FASTENING SYSTEM FOR A NON-RIGID AIRSHIP

Paul E. Yost, P.O. Box 165, Tea, S. Dak. 57064

Filed Sep. 9, 1980, Ser. No. 185,545

Int. Cl.³ B64B *1/46, 1/64*

U.S. Cl. 244—99 **6 Claims**

1. A gas leak proof releasable sealing panel system for a non-rigid gas leak-proof airship formed of a flexible gas leak-proof envelope, comprising:

an aperture in the envelope;

a sealing panel of flexible material dimensioned to cover the aperture;

a first hook-pile fastening strip adjacent a substantial portion of a periphery of the aperture;

a second hook-pile fastening strip adjacent a substantial portion of a periphery of the sealing panel and positioned to releasably mate with the first strip when the sealing panel is aligned in position to cover the aperture; and

a gas sealing heavy viscosity silicon grease applied to at least one of the first and second strips such that when the strips are mated a gas leak proof seal is formed for at least one of the gases selected from the group consisting of helium, coal gas and hydrogen.

4,432,514

DECOMPRESSION EQUALIZATION RELIEF VALVE

Dorris R. Brandon, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

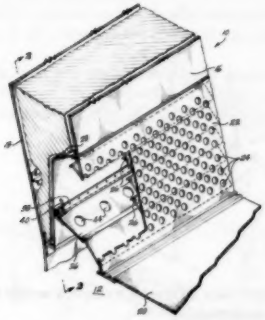
Filed Sep. 23, 1976, Ser. No. 725,809

Int. Cl.³ B64D *25/00, 45/00*

U.S. Cl. 244—118.5 **9 Claims**

1. A pressure relief device in an airplane to provide decompression relief between a passenger compartment having a double side wall and a cargo compartment, the device comprising: a grill to replace a section of an inside wall; ductwork to extend from an upper edge of the grill to an outer wall to form a channel for movement of air between the two compartments; and a pivotally mounted valve to extend across to block the channel, said valve having resilient means sized for holding the valve closed under normal operating conditions and having

perforations sized to allow pressure equalization across the closed valve in response to a low pressure differential and to



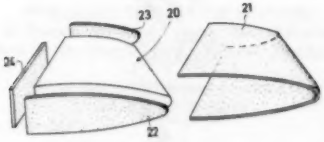
require the valve to open in response to a high pressure differential.

4,432,515

LIQUID FUEL TANK FOR AN AIRPLANE AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Elias A. Järvineva, Halli, Finland, assignor to Valmet Oy, Finland

Filed Mar. 13, 1981, Ser. No. 243,504
Int. Cl.³ B64C *3/34*
U.S. Cl. 244—123 **9 Claims**



1. In a liquid fuel tank for an airplane of the type which constitutes a structural part of the airplane wing and having an outer surface which defines the aerodynamic outer surface of at least a portion of the airplane wing, the improvement comprising:

the liquid fuel tank being defined by walls having a bonded multi-layer sandwich structure having sufficient rigidity and strength while devoid of internal and external reinforcing structure, the sandwich structure including an inner liquid-tight tank formed of thin metallic sheet material, an intermediate core layer formed of a cellular rigid foam plastic material bonded to the outer surface of the inner tank, and an outer shell layer formed of metallic sheet material bonded to the outer surface of the intermediate layer, the outer surface of the outer layer constituting the aerodynamic outer surface of at least a portion of the airplane wing, and wherein said sandwich structure as a unitary structural entity constitutes a load bearing member.

4,432,516

38VARIABLE AIRFOIL ASSEMBLY

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Continuation-in-part of Ser. No. 136,682, Apr. 2, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,561
Int. Cl.³ B64C *3/48, 9/32*
U.S. Cl. 244—219 **19 Claims**

1. In a variable airfoil assembly having:

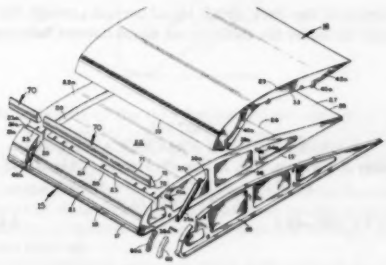
a fixed airfoil member with a bottom wall, a convex nose extending upward and curving rearward from the front end of said bottom wall, and a rear top wall segment spaced behind said nose and inclined downward and rearward toward the rear end of said bottom wall;

an adjustable airfoil member mounted for adjustment between a lowered position on top of said fixed airfoil member between said nose and said rear top wall segment and raised positions projecting up beyond the top of said fixed airfoil member;

and means acting between said fixed and adjustable airfoil members for adjusting the position of said adjustable airfoil member on said fixed airfoil member;

the improvement wherein:

said fixed airfoil member presents a convex top plate extending behind the upper end of said nose and terminating at its rear end slightly below the front of said rear top wall segment;



and said adjustable airfoil member comprises a curved sheet metal plate which closely overlies said nose and said top plate of the fixed airfoil member when the adjustable airfoil member is in said lowered position;

said curved sheet metal plate presenting a convex top surface which in said lowered position of the adjustable airfoil member merges smoothly at its front end with the leading edge of said nose and merges smoothly at its rear end with said rear top wall segment of the fixed airfoil member;

said fixed airfoil member being formed with narrow gaps in said top plate; and

said adjustable airfoil member having narrow reinforcing ribs extending down from said curved sheet metal plate and received in said gaps in said lowered position of the adjustable airfoil member.

4,432,517

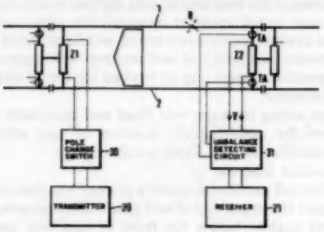
CIRCUIT FOR DETECTING UNBALANCE OF THE TRACTION CURRENT IN A TRACK CIRCUIT

Paolo Ripamonti, Genoa, Italy, assignor to ANSALDO S.p.A., Genoa, Italy

Filed Apr. 3, 1981, Ser. No. 250,862
Claims priority, application Italy, Apr. 18, 1980, 12513 A/80
Int. Cl.³ G08B *21/00*
U.S. Cl. 246—28 F **4 Claims**

1. A device for detecting unbalance of the traction current in a track circuit of the type comprising a track section which is short-circuited by rolling stock, there being a transmitter for transmitting a track circuit signal current and an associated receiver characterized in that the unbalance detecting device comprises two current sensors for coupling to respective rails of the track section, an unbalance detecting circuit for receiving from the current sensors respective signal currents in the respective rails for transmitting track circuit signal currents to the receiver when the signal currents detected by the current sensors are equal and responsive to any detected unbalanced currents of a given frequency and magnitude of unbalance effective to render the unbalance detecting circuit effective to preclude transmission to the receiver, and a pole change switch

for connection between the track circuit current transmitter and the rails associated therewith for alternately changing the direction of the track circuit signal current through the track circuit to render the track circuit signal current balanced.



4,432,518

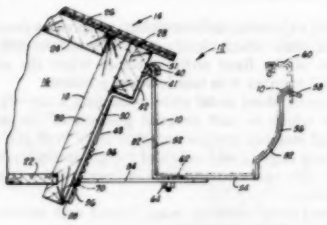
EAVES TROUGH BRACKET ASSEMBLY

Robert J. Navarre, Rte. 2, Box 89, Harrah, Okla. 73045

Filed Nov. 8, 1982, Ser. No. 439,936

Int. Cl.³ E04D *13/06*

U.S. Cl. 248—48.2 **6 Claims**



1. An eaves trough bracket, comprising:

a securing plate adapted to be secured in generally vertical orientation to roof eave structure, and having a plurality of brace slots adjacent the lower end and a retaining hook on the opposite, upper end;

a trough support member having interlocking hooks formed on one end for retentive engagement with said retaining hook, said member including elongated structure for supporting the eaves trough; and

brace plate means secured between one of said securing plate brace slots and said trough support member elongated structure.

4,432,519

MEANS FOR MOUNTING CABLES AND THE LIKE

Howard Wright, Brisbane, Australia, assignor to Burundy, Inc., Ontario, Canada

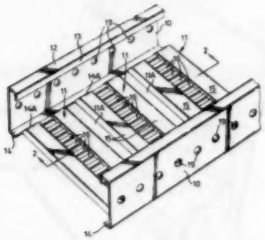
Filed Jan. 15, 1981, Ser. No. 225,264

Claims priority, application Australia, Jan. 17, 1980, PE2041

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—49 **2 Claims**

1. A cable mounting ladder including a plurality of transverse rungs interconnecting a pair of opposed side flanges or side runners which is of arcuate or curved shape wherein each side flange is severed or partially severed to form a multiplicity of severed or partially severed cable mounting ladder sections interconnected by a continuous resiliently deformable strip between adjacent side flanges of a respective side or each side of said cable mounting ladder.



4,432,520

STRAIN RELIEF ASSEMBLY

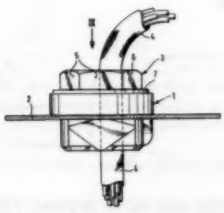
Hans Simon, Bruchhausener Strasse, D-5463 Unkel, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,326

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105316; Apr. 29, 1981, 3117029

Int. Cl.³ F16L *5/00*

U.S. Cl. 248—56 **9 Claims**



1. A cable strain relief assembly comprising a grommet for reception in an aperture of a supporting wall or the like; clamping means receivable in said grommet; said clamping means and said grommet having corresponding cable-receiving passageways; said clamping means having a stationary anchor portion interlockingly engaging with said grommet in which received in interfitting engagement and a flexible band portion movable relative to said anchor portion for gripping engagement with a peripheral portion of a cable passing therethrough; said band portion extending from said clamping means anchor portion and being located in a plane at substantially right angles to the longitudinal axes of said cable-receiving passageways; said band portion having a movable end opposed to said anchor portion; and a clamping means rotatable drive portion connected to said band movable end for rotating said band movable end and moving said flexible band portion about the longitudinal axes of said passageways.

4,432,521

CRADLE CASE

Jack Douglas, 11645 Montana Ave., Los Angeles, Calif. 90049

Filed Jun. 22, 1981, Ser. No. 275,998

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—176 **5 Claims**

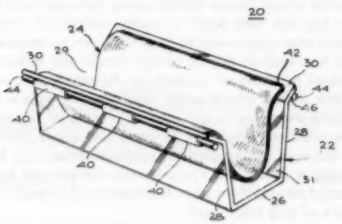
1. An improved eyeglass holder, said holder comprising, in combination:

(a) a base having a bottom support and upstanding opposed sides, defining a central space therebetween, the upper

ends of said sides terminating in lips which diverge outwardly from each other,

(b) a flexible eyeglass cushion cradle overlapping at least a portion of said lips and depending from said lips in said space,

(c) wherein said lips are angled mainly upwardly and outwardly from said base and wherein at least a portion of the side margins of said cradle are secured to said lips,



(d) wherein said cradle comprises a plurality of layers of soft flexible material secured together, and

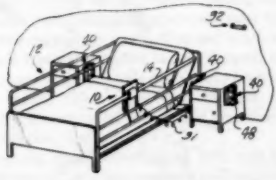
(e) wherein at least one of said layers includes tabs which extend outwardly of the side margins of said cradle and are disposed through said lips and formed into tubes and wherein elongated rods are disposed through said tubes to lock said cradle to said lips.

4,432,522

PORTABLE TELEPHONE SUPPORT

Thomas F. Pruente, and Anna Tamargo, both of Pontiac, Mich., assignors to St. Joseph Mercy Hospital Pontiac, Pontiac, Mich.

Filed Feb. 17, 1982, Ser. No. 349,187
Int. Cl.³ A47B 96/06
U.S. Cl. 248—215 **6 Claims**



1. A portable telephone support for use by hospital patients in a bed having a side rail and a mattress comprising:

a telephone base support;

a bedrail engaging hook member secured to the telephone base support, the bed rail engaging member including a continuous planar piece bent at an upper end to form a hook for engaging the side rail of the bed and a lower end inclined out of the plane of the bedrail engaging member to pass the edge of the mattress without interference when the bedrail engaging member is mounted on the side rail of the bed facing the mattress; and

means for selectively mounting the telephone base support to a wall and a support surface spaced from the bed side of the rail of the bed, the mounting means comprising:

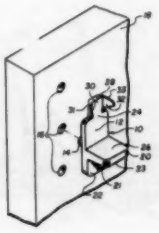
a mounting bracket having a support surface engaging portion and an outer portion joined to and spaced from the support surface engaging portion to define an aperture therebetween for receiving the bedrail engaging member therein.

4,432,523

CABINET SHELF SUPPORT BRACKET

James S. Follows, Surrey, Canada, assignor to Vanguard Plastics Ltd., Surrey, Canada

Filed Apr. 1, 1982, Ser. No. 364,494
Int. Cl.³ A47G 29/02
U.S. Cl. 248—250 **7 Claims**



1. In a cabinet of the type having at least one shelf, the vertical positioning of said shelf being variable and effected through the movement of shelf supports, a shelf support bracket comprising:

a backplate adapted for placement against one surface of a sidewall of said cabinet, said backplate having an upper portion of uniform thickness in a direction orthogonal to said sidewall;

a bracket-mounting means associated with said backplate for removably mounting said backplate to said sidewall;

a shelf support plate projecting from a first surface of said backplate such that said upper portion of said backplate lies above said shelf support plate, said shelf support plate constructed and arranged to receive an edge portion of said shelf;

a shelf-retaining means extending from said upper portion of said backplate, spaced from said shelf support plate and constructed and arranged to cooperate therewith to retain said shelf edge portion on said support plate, said shelf-retaining means including a first portion substantially coplanar with said upper portion of said backplate and of a thickness no greater than the thickness of said upper portion of said backplate and, at least one planar ear portion contiguous with said first portion and extending from a first edge thereof in a substantially upright plane oblique to the plane of said first portion, said ear portion resiliently yieldable to a position in which the surfaces of said upper portion, first portion and ear portion that are distally located from said sidewall and are adapted to contact said edge portion of said shelf are coplanar to permit passage of said shelf edge whereupon said ear portion returns to its original position and overlies said shelf edge portion, said shelf edge portion when in place upon said shelf support bracket lying intermediate said ear portion and said support plate.

4,432,524

THREE POINT SEAT ADJUSTER

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1981, Ser. No. 288,165
Int. Cl.³ A45D 19/04
U.S. Cl. 248—395 **2 Claims**

1. A seat adjuster providing three point support of a seat to the floor of a vehicle or the like, comprising,

a pair of generally parallel, rearwardly disposed guide tracks mounted to the vehicle floor,

a forwardly disposed guide member including a guide bracket pivotally joined to a floor mounted bracket, the guide bracket including a pair of journals and a roller between the journals,

a generally Y shaped seat frame support attached to the seat and including a pair of tubular stem members, each slidably extending through a respective guide bracket journal and engaging the roller to provide a first point of support, the seat frame support further including a pair of leg members, each extending angularly from a stem member and respective to a guide track,

roller means slidably supporting each leg member on a re-

spective guide track, the roller means sliding up and down the guide tracks as the seat frame support is moved forward and backward, the guide bracket pivoting relative to the floor as the seat frame support moves relative to the journals and roller,

and releasable locking means selectively engageable between one of the stem members and the guide bracket to releasably lock the stem members within the guide bracket in a plurality of positions.

4,432,525

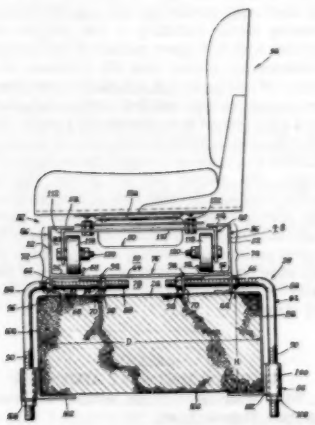
ADJUSTABLE CHAIR SUPPORT

Clarence E. Duvall, 2614 N. Wilson Dr., Peoria, Ill. 61604

Filed Dec. 23, 1981, Ser. No. 333,642

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—430 **7 Claims**



1. An adjustable support device enabling sidewise movement of a chair along a seat bench to a plurality of fixed positions, said device comprising an elongated body, clamp means, a carriage, and latch means;

said elongated body comprising horizontally spaced front and back vertical walls adapted to be mounted on a seat bench, horizontal floor plate means interconnected between the walls at a location intermediate the tops and bottoms thereof to provide a lower space beneath the floor plate means and an upper space above the floor plate means, a pair of inwardly extending horizontal top flanges along the top edges of said walls;

said clamp means comprising a plurality of clamps each including a right-angled rod having a screwthreaded horizontal leg and a depending screwthreaded vertical leg, each said horizontal leg extending through one of said vertical walls into said lower space, each said vertical leg being positionable downwardly along a front or back edge surface of the seat bench and having at the bottom end a saddle member engageable with a lower corner of the seat bench, screw thread means acting between each horizontal leg and said body to enable individual fore-and-aft horizontal adjustment of the rods to accommodate different fore-and-aft depths of seat bench and different fore-and-aft positions of the body on the seat bench, and other screw thread means acting between the vertical legs and saddle members to accommodate vertical adjustment of the saddle members for different seat bench thicknesses;

said carriage having chair attachment means and being retained in said upper space by said flanges and being supported on said floor plate for movement between opposite sides of said body; and

said latch means acting between said carriage and said body to lock said carriage in a plurality of fixed, sidewise-displaced positions.

4,432,526

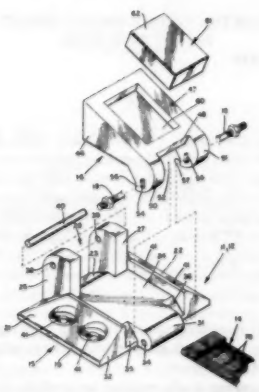
SUPPORT BLOCK ASSEMBLY

Withers, Jr. L. Andrew, 5801 Whispering Pines Cir., Mableton, Ga. 30059; William D. Withers, and Carlo Fineo, both of Austell, Ga., assignors to L. Andrew Withers, Jr., Mableton, Ga.

Filed Jan. 4, 1982, Ser. No. 336,671

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—542 **8 Claims**



1. A support block assembly for cylindrical rolls and the like comprising a pair of support blocks of similar construction, each said support block including a platform for engaging a floor surface, a support plate positioned on said platform, and a strap extending between each said support block, with one end portion of said strap extending between the support plate and the platform of one support block and the other end portion of said strap extending between the support plate and the platform of the other support block, hinge means hingedly connecting together the platform and support plate of each support block in such a manner the weight of the support plate is supported by the platform and the strap is compressed between the support plate and the platform and said support plates each including an upwardly facing support surface sloped downwardly toward the opposite support block,

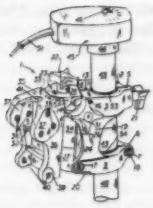
whereby when a cylindrical roll or the like is placed on the support blocks the support surfaces of the support blocks are engaged by the cylindrical rolls and form wedges that support the roll.

4,432,527

TROLLING MOTOR BRACKET

Frank C. Sample, Rte. 2, Box 286B, West Monroe, La. 71291

Filed Mar. 5, 1982, Ser. No. 354,967
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—548 **5 Claims**



1. A trolling motor bracket for supporting the shaft of a trolling motor comprising:

(a) a shaft bracket having a first shaped housing member; a second shaped housing member cooperating with said first shaped housing member; a shaft aperture defined by said first shaped housing member and said second shaped housing member for receiving the shaft of the trolling motor; and rearwardly facing slots in said first shaped housing member and said second shaped housing member;

(b) a bracket hinge pivotally attached to said shaft bracket;

(c) a support bracket hingedly attached to said bracket hinge and top mount flanges provided in said support bracket for attachment to the guide struts of a folding boat bracket and bottom mount flanges provided in said support bracket for attachment to the boat bracket member in the folding boat bracket; and

(d) bracket hinge pin means cooperating with said bracket hinge and said support bracket to permit said shaft bracket to hingedly rotate horizontally on said bracket hinge with respect to said support bracket, said bracket hinge pin means further characterized by a threaded, elongated bracket hinge pin in threadable cooperation with said support bracket for adjusting the hinge tension between said bracket hinge and said support bracket;

(e) two threaded, elongated breakaway pins in threadable cooperation with both sides of said bracket hinge and arranged in essentially oppositely disposed relationship, said breakaway pins normally registering with said rearwardly facing slots in said first shaped housing member and said second shaped housing member, respectively, when the trolling motor is in normal operating configuration; and

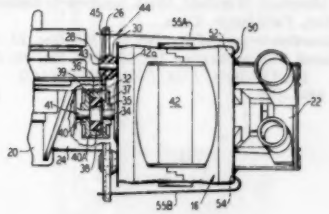
(f) a threaded, elongated shaft tension screw in threadable cooperation with said shaft bracket for selectively exerting pressure against the shaft of the trolling motor and biasing the shaft of the trolling motor at a selected height in said shaft bracket.

4,432,528

EASY SERVICE MOTOR MOUNT FOR AN AUTOMATIC WASHER

Gerald L. Kretchman, St. Joseph, and Anthony Mason, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 20, 1980, Ser. No. 179,897
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—603 **11 Claims**



1. An automatic washer motor mount for connecting a motor to a gear case, said motor having a housing with an end bell at one end and a plurality of pilot studs at an opposite end and a drive shaft therethrough, said motor mount comprising:

a mounting plate secured to said gear case

said mounting plate having a plurality of openings therethrough, for receiving a plurality of resilient bushings and said drive shaft,

said bushings being selectively connected to said motor housing by means of said pilot studs,

at least two tension arms external of said motor housing, said tension arms being connected to one end to said mounting plate and at an opposite end to said motor housing end bell and having points of contact only at said ends,

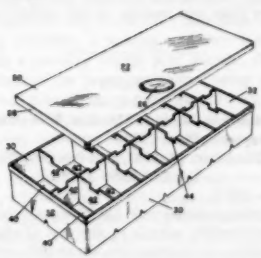
whereby said motor is secured against said bushings such that vibration from said motor is dampened and is only minimally transmitted to said gear case.

4,432,529

ICE TRAY WITH LID

Charles McMillan, 218 E. Franklin St., Quincy, Fla. 32351

Filed Sep. 30, 1982, Ser. No. 431,758
Int. Cl.³ B29C *1/02*
U.S. Cl. 249—52 **1 Claim**



1. A stackable, covered ice cube tray structure comprising a tray having an outwardly flared bead around its upper peripheral edge and a removable tray cover having a downwardly extending skirt around its lower peripheral edge which secures to said tray by engaging said outwardly flared bead on said tray, ice cube forming compartments in said tray, said tray and said tray cover combination having a recessed filling means in said cover, surrounded on all sides by said tray cover, for filling said covered ice cube tray and a cap on said filling means

coplanar with said cover, with fluid when said tray cover is secured to said tray, whereby when said covered trays are stacked, smooth, planar surfaces on said tray covers will allow close engagement of said trays and result in compact, efficient storage of same.

4,432,530

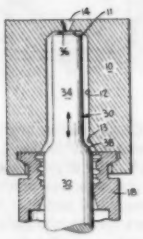
MOLD-CORE ROD COMBINATION FOR FORMING AN INJECTION MOLDED PLASTIC PARISON

John A. Marcinek, Westfield, Mass., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation-in-part of Ser. No. 863,746, Dec. 23, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,426

Int. Cl.³ B29C *1/14, 17/07;* **B29D** *23/02*

U.S. Cl. 249—142 **6 Claims**



1. A plastic mold-core rod combination for forming an injection molded plastic parison having a bottom, a sidewall, a shoulder, and a neck finish comprising a female parison mold having a flat area at the bottom surface thereof and a sharply tapered annular corner surface extending from said flat at said bottom surface into a sidewall surface and terminating at a neck finish, and a core rod having a flat area at the end portion thereof and a sharply tapered annular corner surface extending from said flat into a sidewall surface; said flat at said end portion, said sharply tapered annular corner surface and said sidewall surface of said core rod, and said flat at said bottom surface, sharply tapered annular corner surface and sidewall surface of said mold constructed and arranged to mate and form a cavity having a bottom area thickness, a sidewall area thickness and an annular corner area thickness connecting said bottom and sidewall areas, said bottom area thickness and annular corner area thickness being less than said sidewall area thickness and having a rapid transition from the thickness at the middle of said bottom cavity area to said sidewall cavity area of greater thickness, said sidewall thickness being substantially constant from said annular corner surface to the shoulder.

4,432,531

VEHICLE JACK

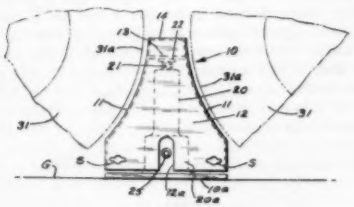
Terry D. Bevans, and James L. Hammer, both of 6902 Manhattan Ln., Cheyenne, Wyo. 82001

Filed Apr. 12, 1982, Ser. No. 367,551

Int. Cl.³ B66F *3/36*

U.S. Cl. 254—100 **2 Claims**

1. An operably raisable jack for lifting a vehicle having a pair of aligned tandem wheels by the pair of aligned tandem wheels comprising, in combination, a manually vertically operable jack having a transverse base plate and a raisable shaft portion, a bell-shaped housing extending around the jack and removably secured to the top of the raisable jack shaft, said housing having four sides, with two of said sides being diametrically opposed and formed as inward arcuate vertical surfaces, and the other two of the housing sides being diametrically formed as opposing flat vertical surfaces, said arcuate opposed surface sides being adapted to frictionally wedge abut the outer periphery of a pair of aligned tandem wheels upon jack operation between such pair of aligned wheels for effecting jack vehicle raising by said wheels, and said housing flat opposed surface sides each having aligned bayonet-slot openings adjacent their lower edges and with each opening being adapted to removably receive and hold a transverse wheel lifting bar therein.



4,432,532

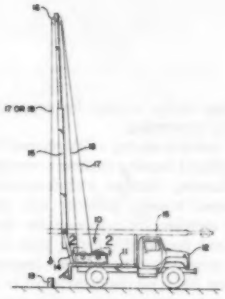
DIRECT DRIVE DUAL DRUM WINCH

Mark Overholt, 6867 Wooster Pike, Medina, Ohio 44256

Filed Jan. 27, 1983, Ser. No. 461,644

Int. Cl.³ B66D *1/08;* **F16D** *1/00, 3/50*

U.S. Cl. 254—291 **4 Claims**



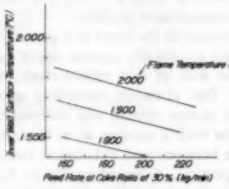
1. A direct drive dual drum line and cable winch for the deck of a mobile well tending rig, comprising: a generally rectangular frame with front and rear channels for cross connection of a drive side plate to a parallel second side plate, the base of said frame being adapted for attachment to said rig deck, each said side plate having front and rear holes therethrough for integral attachment of a bearing mounting block, each said front and rear mounting block having a circular bore; front and rear opposed and axially aligned bearings positioned within said bore of a mounting block, each said bearing having a radial flange for attachment to a mounting block; front and rear winch drums positioned within said frame transversely of said side plates, each said drum having a shaft rotatably mounted within a bearing on said second side plate and a drive shaft rotatably mounted within and axially projecting beyond a bearing on said drive side plate; front and rear bell housings positioned coaxially around each said drum drive shaft, the inner ends of each said housing being connected to a drive side plate outwardly of said radial flange of a bearing, the outer end of each said housing being adapted for mounting a hydraulic motor; front and rear hydraulic motors each having radial pistons and an axially oriented inwardly projecting drive shaft aligned with said drive shaft of a winch drum; and, flexible couplings connecting said aligned drive shafts within said bell housings.

4,432,533

FLAME GUNNING OF REFRACTORY LININGS

Masuto Shimizu; Tadashi Morimoto; Motoyasu Yaji; Masaaki Tsukamoto, all of Chiba; Takao Suzuki, Ichihara, and Shigeru Ogura, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Apr. 1, 1982, Ser. No. 364,414
Claims priority, application Japan, Apr. 6, 1981, 56-51387; Apr. 6, 1981, 56-51389; Apr. 6, 1981, 56-51396
Int. Cl.³ F27D *1/16*
U.S. Cl. 266—44 5 Claims



1. In a method of repairing a refractory lining of a vessel lined with refractory by a flame-gunning process, comprising flame-gunning a patching material consisting of refractory particles and carbonaceous fuel powder, together with an oxygen containing gas to fuse or semi-fuse the refractory particles in a region surrounded by high temperature flame, and strucking the flame-gunned material against the surface of the refractory lining to produce a deposit layer of the refractory particles, the improvement comprising flame-gunning at an initial stage of repairing a patching material having a higher mixing ratio of the fuel powder, and subsequently flame-gunning, in order with the progress of rapairing, patching materials in which the mixing ratio of the fuel powder is lowered stepwise, and during which blowing the oxygen containing gas in such an amount that the oxygen content in the oxygen containing gas is substantially less than the theoretical amount required for complete combustion of the fuel powder, and controlling a blow rate of the oxygen containing gas in accordance with the change of the mixing ratio of the fuel powder in the patching material.

4,432,534

OXYGEN LANCE FOR STEEL CONVERTER

Hugues Zanetta, St. Julien-les-Metz, and Daniel Richard, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint Germain-en-Laye, France

Filed Feb. 10, 1983, Ser. No. 465,559
Claims priority, application France, Feb. 10, 1982, 82 02173
Int. Cl.³ C21C *5/32*
U.S. Cl. 266—225 12 Claims

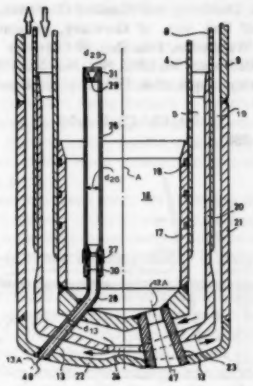
1. A gas-injection lance comprising:

a main tube centered on an axis and having a lower end formed adjacent the axis with a plurality of throughgoing inner orifices and an upper end;

means for feeding a treatment gas under pressure to the upper end and thereby pressurizing the interior of the tube therewith sufficiently that the gas exits from the lower end through the inner orifices at supersonic speed;

an annular array of nozzles traversing the lower tube end around the inner orifices and each having an outer end opening outside of the tube and an inner end inside the tube; and

respective pressure-reducing means each having one side open at the lower tube end inside the tube and another side connected to the inner end of a respective nozzle for passing gas from the interior of the tube into the nozzles



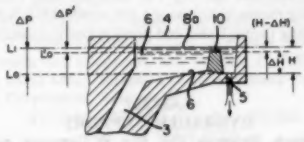
with a substantial pressure reduction so that the gas exits from the outer ends of the nozzles at subsonic speed.

4,432,535

PRESSURE POURING FURNACE

Tsuguharu Ohmori, and Sadaumi Ueno, both of Suzuka, Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Aug. 6, 1982, Ser. No. 405,737
Claims priority, application Japan, Aug. 8, 1981, 56-124570
Int. Cl.³ B22D *39/00*
U.S. Cl. 266—239 5 Claims



1. A molten metal pressure-type pouring furnace comprising a molten metal storing chamber, means for selectively impressing an air pressure onto the surface of molten metal stored in said storing chamber, a pouring chamber having a bottom surface with a pouring nozzle port therein, the area of the bottom surface of the pouring chamber being larger than the cross-sectional area of the pouring nozzle port, a passageway communicating with said storing chamber and having an outlet in said pouring chamber, and a weir having a predetermined height extending above the bottom surface of said pouring chamber to separate the passageway outlet from said pouring nozzle port, wherein said weir is arranged between said outlet and said pouring nozzle port to define a well having a larger cross-sectional area than the cross-sectional area of the pouring nozzle port for receiving a quantity of molten metal desired to be poured so that the level of molten metal is set at a predetermined height above the bottom surface of said pouring chamber and is thereby poured through said pouring nozzle port at a predetermined rate, thereby enabling a prelevel of molten metal in said pouring chamber to be set, at a first air pressure, at a level corresponding almost to the height of said weir, whereby a second air pressure for effecting the pouring of said metal from said well through said pouring nozzle port is reduced.

4,432,536
MOLTEN IRON CONTAINING VESSEL WITH IMPROVED REFRACTORY LINING

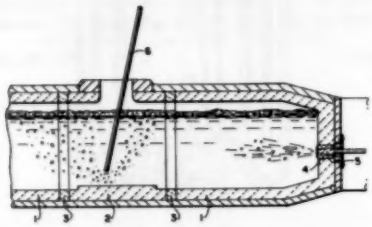
Heinz Coordes, Duisburg, and Manfred Oberbach, Krefeld-Vergerg, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,499

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114069

Int. Cl.³ C21B *5/00*

U.S. Cl. 266—280 **11 Claims**



1. In a horizontal vessel for transporting and desulfurizing pig iron, said vessel being of the type including a horizontally elongated tubular portion, an end portion facing and closing the tubular portion, and a gate portion between said tubular and end portions and having an upper opening through which pig iron may be charged into said vessel, and a refractory fireproof inner lining, the improvement wherein:

said lining in said tubular and end portions comprises dolomite;

said lining in said gate portion comprises bauxite;

said lining includes magnesia bricks between said dolomite and bauxite; and

means for injecting a flushing gas into said end portion of said vessel and thereby for reducing slag therein, said injecting means comprising a gas permeable brick member extending through said end portion into the interior of said vessel.

4,432,537
HYDRAULIC SUPPORT

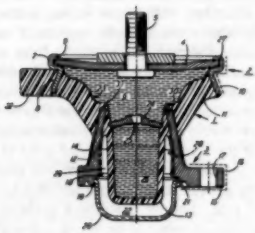
Hubert Pletsch, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 174,528, Aug. 1, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,258

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932478

Int. Cl.³ F16F *1/36*

U.S. Cl. 267—8 R **5 Claims**



1. A hydraulic support for supporting and damping a motor vehicle engine comprising:

(a) a metallic ring with an end face;

(b) a cover closing said ring at its end face, said cover having a first abutment extending therefrom;

(c) a rubber-elastic hollow body having an upper end adhesively connected along its circumference to said metallic ring and having a lower end formed as an integral cup shaped portion;

(d) an internal nozzle system dividing said hollow body into first and second chambers, said cup shaped portion being said second chamber, said chambers connected to each other by said nozzle system, and the wall of said body dished inwardly from the upper end of said body toward said nozzle system in the area of said first chamber to form an generally conical inner surface;

(e) a second abutment in the form of a generally cylindrical member having a conically tapered upper end embedded in part of the wall of said rubber-elastic hollow body defining said first chamber, extending above and surrounding said nozzle system and surrounding said cup shaped portion with a spacing so as to define an empty annular space between said cylindrical member and said cup shaped portion, a mounting flange formed at the lower end of said cylindrical member;

(f) a closure cup closing off the lower end of said cylindrical member; and

(g) a circular reinforcement of the material of the hollow body over the end of said embedded cylindrical member, in said first chamber, forming a stop for the cover for maximum spring excursion.

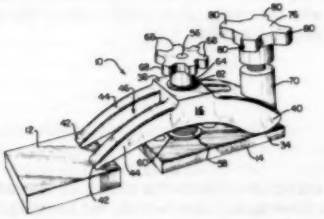
4,432,538
MACHINE TOOL CLAMP

Hector Sequin, 11902 W. Dakota Dr., Lakewood, Colo. 80228

Filed Nov. 30, 1981, Ser. No. 325,638

Int. Cl.³ B23Q *3/02*

U.S. Cl. 269—92 **22 Claims**



1. A machine clamp adapted for gripping a work piece, comprising:

a base plate having first and second ends;

an upright guide post secured to said base plate;

a clamp member having a central portion receiving said guide post, a heel end positioned over said first end of said base plate, and a pair of parallel elongated curved fingers extending from said heel end in an arch shape and having a slot therebetween, said fingers each terminating in a free end and said central portion being defined by a brace block extending across said slot and formed integrally with and as a solid extension of said fingers;

first adjustment means associated with said guide post for moving said central portion toward and away from said base plate; and

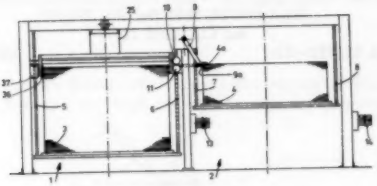
second adjustment means associated with said heel end for selectively moving said heel end away from said base plate and permitting return of said heel end in a direction toward said base plate.

4,432,539

SHEET FEEDING SYSTEM FOR PRINTING MACHINES

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,988
Int. Cl.³ B65H 5/10
U.S. Cl. 271—3.1 15 Claims



1. Printing machine sheet feeding system having primary means (1.) for stacking sheet and for removal therefrom of sheets, one-by-one, for printing thereon, and comprising

a secondary sheet stacking means (2) located laterally adjacent the primary sheet stacing means (1) and parallel to an edge of the sheets in the primary sheet stacking means,

said secondary sheet stacking means being adapted to hold secondary or scrap or waste sheets for selective introduction into the printing machine prior to printing on the sheets in the primary sheet stacking means;

separating means (9*a*, 26*a*) comprising

a gripper means (9, 9*a*; 26, 26*a*) separating a plurality of secondary sheets from the secondary stack (4) to form a package of secondary sheets and positioned for gripping said package of sheets from the secondary stack (4),

said gripper means being movable for moving said package of sheets towards the primary stack (3);

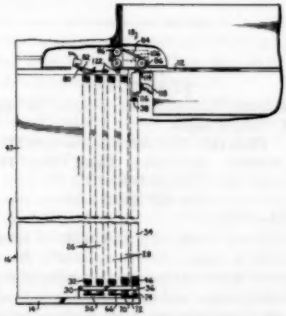
and secondary sheet transport means (9, 20, 21, 22, 23; 26, 27, 28, 29, 30) movable between said secondary and primary sheet stacking means and transporting separated secondary sheets (4*a* 4'*a*) from the secondary stack (4) to and over the topmost sheet of the primary stack (3).

4,432,540

MAIL SORTING MACHINE WITH IMPROVED CONVEYOR AND ENVELOPE SEPARATING DEVICE

Roy Akers, Johnson County; Charles R. Hartman, Douglas County, and Keith B. Deutch, Johnson County, all of Kans., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 5, 1981, Ser. No. 231,593
Int. Cl.³ B65H 3/04
U.S. Cl. 271—8 A 6 Claims



1. In a mail sorting machine having a magazine section for receiving a supply of envelopes and delivering the envelopes to a feed station at which the envelopes are separated individually from the envelope supply, an improved conveyor comprising:

a plurality of generally horizontal rollers mounted on the magazine section of the machine for rotation about substantially parallel axes located in a common horizontal plane, said rollers being located to receive the envelope supply with the lower edge of each envelope on the rollers and the envelopes oriented substantially vertical, said horizontal rollers being arranged to present first and second sets thereof;

a spiral groove in each roller for receiving the lower edges of the envelopes, said grooves being arranged to convey the envelopes lengthwise along the rollers toward the feed station of the machine in response to rotation of the rollers;

at least one raised roller mounted on the magazine section of the machine for rotation about an axis oriented generally parallel to the rotational axes of said horizontal rollers, said raised roller being elevated relative to said horizontal rollers at a location to engage a vertical edge of each envelope loaded on the horizontal rollers, said raised roller being adjacent said first set of horizontal rollers and being remote from said second set of horizontal rollers;

a spiral groove in said raised roller arranged to receive said vertical edges of the envelopes to assist in conveying the envelopes and maintaining the vertical orientation thereof; and

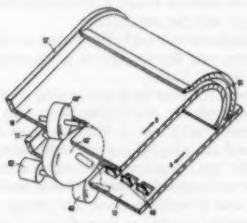
drive means for effecting rotation of each roller to convey the envelopes along the magazine section to the feed station of the machine, said drive means including first power means operable to effect rotation of said first set of horizontal rollers and said raised roller when activated and second power means operable to effect rotation of said second set of horizontal rollers when activated.

4,432,541

RECIRCULATING DOCUMENT FEED APPARATUS AND METHOD FOR ALIGNING DOCUMENTS THEREIN

William D. Clark, Longmont; Mark D. Garner, Boulder; John H. Rhodes, Jr., Longmont, and Bernard L. Wilzbach, Berthoud, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,684
Int. Cl.³ B65H 9/16
U.S. Cl. 271—251 3 Claims



1. The method of aligning the side of a document against a reference edge which is located parallel to the direction of document travel, and in which said document is moved through the nip of rollers in which said document may slip while it is being moved toward the reference edge, comprising the step of:

skewing a first roller on the drive side of the nip to the direction of document travel in a manner to provide a force component away from said reference edge;

skewing a second roller on the nondriven side of the nip to the direction of document travel in a manner to provide a

force component toward said reference edge so that when said document slips on said first roller it tends to follow said second roller toward said reference edge; and

providing said second roller with a lower coefficient of friction than said first roller to avoid crumpling said document when it is against said reference edge.

4,432,542

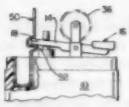
JOKE CIGARETTE LIGHTER

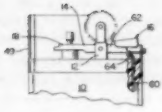
Donald B. Poynter, Cincinnati, Ohio, assignor to Poynter Products, Inc., Cincinnati, Ohio

Continuation of Ser. No. 56,050, Jul. 10, 1979, abandoned. This application Jun. 24, 1981, Ser. No. 277,036

Int. Cl.³ A63H *33/30*

U.S. Cl. 272—27 W **3 Claims**





1. A novelty apparatus, comprising:

(a) an enclosed fluid container having an opening;

(b) valve means associated with said container and movable between open and closed positions, said valve means being operable to selectively establish fluid communication between the interior of the container and the atmosphere, the interior of the container being in fluid communication with the atmosphere when said valve is in the open position;

(c) means for expelling fluid in said container whenever fluid communication is established between the interior of the container and the atmosphere;

(d) friction means rotatably supported on the exterior of said container, said friction means being adapted to interface with a human finger;

(e) a bi-stable actuator mounted on said container, said actuator cooperatively interacting with said valve means to move said valve means between open and closed positions, said actuator having one stable position corresponding to the open position of said valve means and one stable position corresponding to the closed position of said valve means, said bi-stable actuator including a lever arm pivotally mounted on the exterior of said container and a holding member resiliently urged against an end of said lever arm, said holding member cooperating with said lever arm to interface at two stable positions, one of said stable positions corresponding with a closed position of said valve means and the other stable position corresponding to an open position of said valve means, said holding member comprising an integral one-piece resilient clip member having opposed ends, one of said opposed ends of said resilient clip member being secured to said apparatus by being press-fitted into said opening of said container in a manner to cantilever mount the other of said opposed ends, said resilient clip member having an outwardly protruding section intermediate said ends thereof for acting on said end of said lever arm, said protruding section having opposed surfaces respectively engaging said end of said lever arm in said two stable positions.

4,432,543

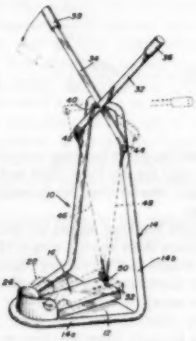
PHYSIOTHERAPEUTIC SELF-EXERCISER

Michel Normandin, 1328 Nelles, Ste-Foy Quebec, Canada

Filed Feb. 24, 1982, Ser. No. 351,617

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—126 **14 Claims**



1. A physiotherapeutic self-exerciser to enable a patient to apply himself traction to the muscles or tendons of his foot comprising:

a base;

a sabot pivotably mounted relative to said base, said sabot adapted to fixedly receive the foot of the patient, said sabot having a toe end and an ankle end;

support means for supporting said self-exerciser, and associated with said base;

lever means mounted to said support means and being articulatable relative to said support, said lever means having one end actuatable by the patient so that the latter may use his weight to articulate said lever means; and

tie means connecting the other end of said lever means to said toe end of said lever means whereby the patient, by gradually applying his weight to the lever means, exerts a tension of the sabot, said tension exerting traction to the foot muscle or tendon to be treated;

said lever means consisting essentially of a pair of levers in scissor-like arrangement, each lever having one end manually engageable by the patient and the other end connected to said tie means.

4,432,544

FISHING TOY

Kazuo Wakimura, Tokyo, Japan, assignor to Mitsuwa Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,733

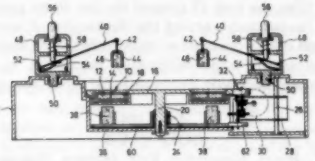
Claims priority, application Japan, Oct. 16, 1980, 55-147246[U]; Oct. 16, 1980, 55-147247[U]

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—1 M **8 Claims**

1. A fishing toy comprising a plurality of small toy bodies each containing a magnet therein, a rotatable disc consisting of a non-magnetic body and having a plurality of receiving parts each accommodating a said small toy body individually, a base on which said rotatable disc is rotatably mounted, a driving means mounted to said base for rotating said disc, magnets

arranged under said disc each corresponding to a said receiving part for overturning a said small toy body by magnetic



repulsion, and a fishing rod provided with a magnet for fishing up and holding a said small toy body by magnetic attraction.

4,432,545

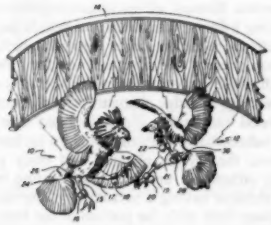
NON-LETHAL COCK FIGHTING SYSTEM

Charles C. Vanderpool, R.D. #1, Waverly, N.Y. 14892

Continuation-in-part of Ser. No. 173,058, Jul. 28, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,577

Int. Cl.³ A01K *29/00*

U.S. Cl. 273—1 GC **7 Claims**



1. Apparatus for conducting and scoring cock fights between two combating birds, said apparatus comprising, in combination:

(a) individual switch means mounted upon each leg of each bird in place of or in covering relation to the natural spur, each of said switch means including a member movable along the axis of the natural spur in response to a blow struck substantially along said axis and by a distance commensurate with the force of said blow;

(b) means for generating an individual electrical signal upon each movement of said member by at least a minimum increment of said distance, said signal having a parameter distinctive to each of said switch means and to a plurality of distinct increments of said distance;

(c) means attached to the skin of each bird in a posterior area below the tail features where the feathers have been removed for transmitting said individual signals to a location remote from said birds;

(d) signal processing means at said remote location for receiving said transmitted signals and for indexing a counter associated with each of said signals parameters in response to reception of each individual signal of said parameter; and

(e) display means providing a visual indication of the accumulated count of each of said counters, thereby scoring the fight according to the number of blows of each increment of force struck by each leg of each bird.

4,432,546

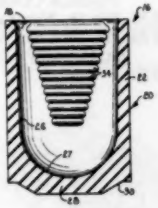
FINGER INSERT FOR BOWLING BALLS

Bernard D. Allen, Jr., 4108 N. Belmont, Kansas City, Mo. 64117

Filed Sep. 20, 1982, Ser. No. 419,716

Int. Cl.³ A63B *37/00, 43/02*

U.S. Cl. 273—63 A **3 Claims**



1. An insert for a finger hole in a bowling ball, said insert comprising:

a resilient body adapted to be inserted into the finger hole, said body having a generally cylindrical wall surrounding a finger opening which is sized to receive a finger tip and which extends into said body from an open end thereof;

a solid bottom of said body providing a closed end opposite said open end;

a finger pad forming one portion of said wall for cushioning the finger tip, said finger pad gradually tapering in thickness from said open end toward said closed end and presenting a substantially planar friction surface facing into the finger opening of said body; and

a plurality of transverse corrugations on said friction surface to texture same and increase the frictional force and gripping action of the finger tip applied thereto, said corrugations gradually decreasing in length from said open end toward said closed end.

4,432,547

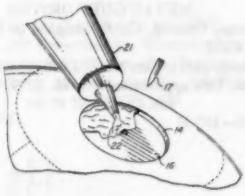
INFLATABLE BALL REPAIR

Malcolm E. Richards, Litchfield Park, Ariz., assignor to Mafix, Incorporated, Litchfield Park, Ariz.

Filed Aug. 2, 1982, Ser. No. 404,361

Int. Cl.³ A63B *41/12, 41/08;* **B32B** *35/00*

U.S. Cl. 273—65 R **25 Claims**



1. A method of repairing an inflatable ball comprising the steps of:

cutting an access opening about the existing inflation port and through the cover of a ball to be repaired, leaving any cover stitching intact;

removing any existing bladder from said ball cover via said access opening;

inserting an inflatable bladder into said ball cover via said access opening;

adhesively affixing said inflatable bladder within said ball cover in position for ease of inflation thereof; and

selectively applying an adhesive filler material to said access opening for purposes of restoring the surface integrity of

said ball cover by eliminating said access opening while providing air valve access through said restored surface to said inflatable bladder for inflation thereof.

17. A manufacture comprising a repaired inflatable ball produced by the method of claim 1.

4,432,548

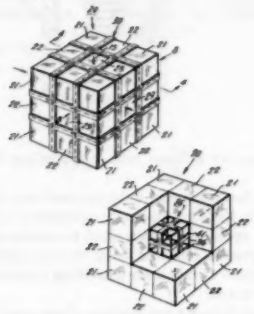
PUZZLE CUBE

Peter Kassan, 160 W. 16th St., New York, N.Y. 10011

Filed Jun. 14, 1982, Ser. No. 388,081

Int. Cl.³ A63F *9/08*

U.S. Cl. 273—153 S **7 Claims**



1. A puzzle cube comprising a plurality of smaller cubes; the smaller cubes together forming a square having an odd number on each of the sides of the puzzle cube;

a framework containing the smaller cubes in large cubical arrangement, said framework extending along margins between the cubes and permitting the cubes to be manipulated through the framework;

a central cage within said larger cube;

a center cube from at least one of the sides of said puzzle cube, being movable into said central cage and out of said central cage;

said central cage comprising a framework open on each side and into which the central cube forming part of any one side of the larger cube may be moved;

said puzzle cube including biasing means on said central cage, biasing any cube moved thereinto outwardly of said cage.

4,432,549

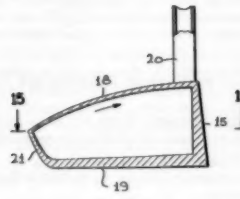
METAL GOLF DRIVER

John Zebelean, Oxnard, Calif., assignor to Pro-Pattern, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 872,092, Jan. 25, 1978, Pat. No. 4,214,754. This application Jan. 26, 1979, Ser. No. 6,577

Int. Cl.³ A63B *53/04*

U.S. Cl. 273—167 H **14 Claims**



1. A golf driver comprising:

an enclosed body of preselected metal, shaped in the form of a golf driver head having a front face side **15**, a bottom sole-defining side **19**, a back side **21**, a heel **17** and an opposite toe **16**, a top side **18** and a hollow neck **20** extending from said body at said heel **17** at a preselected angle, the mass of said body being distributed to increase from the top side **18** toward the bottom sole-defining side **19** and from the heel **17** toward the toe **16** by progressively *and continuously* varying the thicknesses of selected ones of said sides from one end to the other, with said to side **18** progressively *and continuously* increasing in thickness from said back side **21** toward said front face side **15**.

4,432,550

GOLF CLUB

Larry W. Byars, Greenville; Eric Jackson, Seneca, both of S.C., assignor to Tranoco, Inc., Travelers Rest, S.C. and Dunlop Sports Company, div. Dunlop Tire and Rubber Corp., Buffalo, N.Y.

Filed Jul. 16, 1982, Ser. No. 398,967

Int. Cl.³ A63B *53/04*

U.S. Cl. 273—169 **7 Claims**

3. In a golf club, a substantially all wooden club head having a body portion formed of uncompressed wood, said body portion having a forward inclined face which slopes upwardly and forwardly from the bottom of the body portion to substantially the top thereof and also extends for substantially the entire length of the body portion in the heel to toe direction on the club head, and a wedge element formed of compressed and densified wood and having a rear inclined face abutting and registering substantially with the forward inclined face of the body portion, the wedge element and body portion being permanently adhesively united at the abutting inclined faces, the wedge element having a bottom face disposed in a generally level plane flush with the bottom of the body portion and forming the greatest part of the sole of the completed club head and extending substantially from the heel to the toe of the club head and from its front to a point near the rear thereof, and the wedge element further including a generally upright front striking face extending substantially from top to bottom of the club head and from heel to toe thereof in the completed club head.

4,432,551

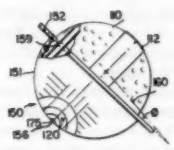
GOLFER'S TRAINING AID

Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373

Continuation-in-part of Ser. No. 282,054, Jul. 10, 1981. This application Nov. 16, 1981, Ser. No. 321,572

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—183 C **8 Claims**



1. A golf ball mark reading device comprising:

a transparent member, said member being formed with a hemispherical portion, said hemispherical portion being

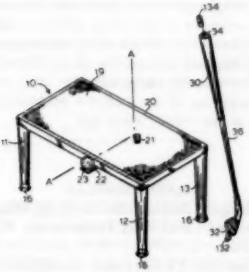
sized so as to rotatably receive a golf ball on the inside of the hemispherical portion, and the said hemispherical portion being formed with a central marking, and means formed on the hemispherical portion including a surface for determining the club face angle, so that a golf ball having an alignment marking thereon, for aligning the ball on the tee prior to club face impact and also having an impact mark caused by a golf club face impact on the ball adjacent said marking is placed within the inside of the hemisphere and rotated until the impact mark on the golf ball is aligned with the central marking of the hemisphere so that the center of the impact mark is determined and the surface of the means forms an angle with the alignment marking which angle indicates the club face angle at impact.

4,432,552

GOLF PRACTICE APPARATUS

Bennett J. Saverino, 73-36 196th St., Flushing, N.Y. 11365

Filed Apr. 15, 1982, Ser. No. 368,525
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—183 A **4 Claims**



1. A golf practice device for use over a floor area, comprising:

a golf platform having a plurality of legs of predetermined height for supporting said platform approximately 10 inches over the floor area, said platform including artificial grass disposed on the top surface thereof,;

means for individually lengthening and shortening each of said plurality of legs supporting said platform, so that the top surface thereof can be tilted to any desired orientation, and

a shortened golf club reduced in size approximately equal to the predetermined height of said golf platform, said golf club having a length which permits a golf ball to be played indoors in a room having restricted ceiling height by a golfer, the shaft of said golf club including a weight at each end thereof to compensate for the weight loss resulting when the opposite ends were removed from a standard golf club shaft to produce the shaft of said shortened golf club, whereby when a golf ball is disposed on the top surface of said platform, a golf player can accomplish a full and balanced swing of the golf club indoors without obstruction.

4,432,553

COWBOY RODEO CONTEST GAME

Hazel M. Moore, 148 Kellie La., Auburn, Calif. 95603

Filed Dec. 21, 1981, Ser. No. 332,729
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—244 **6 Claims**

1. A game simulative of plural rodeo events comprising in combination:

a board radially divided into equal N sections,

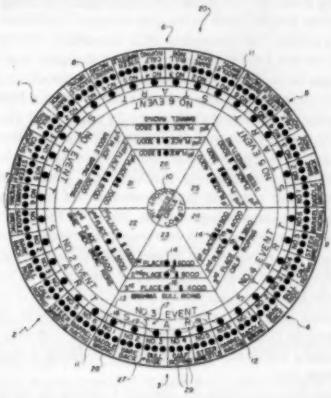
first and second playing paths peripherally disposed about said board,

said first playing path disposed concentrically inward relative to said second playing path and leaving an awards area in each said section corresponding to a specific said rodeo event,

a plurality of playing pieces deployable in said paths and said awards area,

chance means for directing the deployment of said playing pieces,

and a central winner's zone on said board adapted to receive



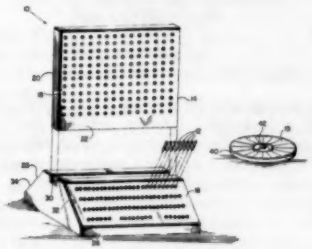
at lesst one of said playing pieces denoting an overall winner wherein each said awards area includes a means for differentiating performance of a player in said specific rodeo event wherein N holes are provided in each said first playing path section and and N playing pieces are disposed therein at the outset of said game wherein three N holes are provided in each said second playing path section, said first and second playing paths subdivided into N segments having equal number of holes, whereby playing pieces advance from said first playing path to and along said second playing path responsive to said chance means.

4,432,554

WORD GAME APPARATUS

Earl T. Beamon, 289 Conestoga St., Windsor, Conn. 06095, and Joanne M. Bouchard, 15 Grafton St., Hartford, Conn. 06106

Filed Feb. 16, 1982, Ser. No. 348,780
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—272 **8 Claims**



1. A word game apparatus for playing a two player game, said apparatus comprising:

a plurality of playing pieces, each in the form of an elongated cylindrical peg with opposite end surfaces, a number of said pegs being letter pegs bearing a letter of the alphabet on each of their opposite end surfaces, the letter on one end surface of each letter peg being different than the letter on its opposite end surface and each of said opposite end surfaces having a characteristic which visibly distinguishes it from its opposite end surface, the letters on the end surfaces of one characteristic therefore forming one set of letters which may be assigned to one player and the letters on the end surface of the other characteristic forming a second set of letters which may be assigned to the other player, said letter pegs being of sufficient variety as to permit the formation of a numerous variety of words from the letters of each set, the remaining number of said pegs being blank pegs having blank opposite end surfaces,

a self-supportive game board in the form of a broad, rectangular platen having substantially planar and parallel opposite board faces and also having a base portion along one edge of said platen, said platen including circular openings extending completely through said game board and arranged in a matrix pattern on each of said faces, each of said openings being of such size as to loosely receive one of said pegs inserted endwise therethrough so that after such insertion one of its end surfaces will appear adjacent one of said board faces and the other of its end surfaces will appear adjacent the other of said board faces,

a stand including means for supporting said game board upright from its base portion with its opposite faces positioned vertically and means for holding a supply of said pegs, and

means for indicating by chance a course of action a player must take regarding the addition of pegs to and the removal of pegs from said game board during a game.

4,432,555

CENTRIFUGAL SEAL WITH DEFORMABLE FRUSTOCONICAL SEALING RING

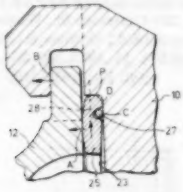
Kenneth R. Langley, Gloucestershire, England, assignor to Rolls Royce Limited, England

Continuation of Ser. No. 119,935, Feb. 8, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,609

Claims priority, application United Kingdom, Feb. 21, 1979, 790617

Int. Cl.³ F16J *15/34, 15/54*

U.S. Cl. 277—25 **8 Claims**



1. An arrangement for forming a seal, relying on both mechanical and centrifugal forces, between two components which rotate together and between which relative movement in a radial direction is tolerated, said arrangement comprising a deformable substantially frusto-conical sealing ring, which when mechanically urged radially outward, forms a circumferential line of contact along one of the two components, the frusto-conical sealing ring being so shaped and dimensioned that during rotation of the two components, centrifugal forces, acting on the deformable frusto-conical sealing ring, impart a turning moment to the sealing ring thereby forming a seal between the sealing ring and both of the components.

4,432,556

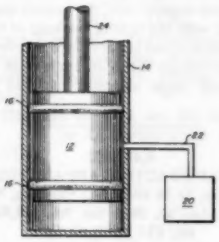
PISTON SEALING ARRANGEMENT FOR A CRYOGENIC REFRIGERATOR

Geoffrey F. Green, Annapolis, and James C. Humphrey, Clinton, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,117

Int. Cl.³ F01B *31/00;* **F16J** *15/40, 1/00*

U.S. Cl. 277—73 **2 Claims**



1. A piston sealing arrangement for a cryogenic refrigerator of the type having a piston slidably and concentrically disposed within a cylinder to moveably define a variable volume expansion chamber for cooling a refrigeration gas comprising:

dual O-rings disposed around the circumference of the piston to define a buffer therebetween; and

means for supplying to the buffer a pressurized gas of the same type as the refrigeration gas.

4,432,557

CASSETTE SEAL

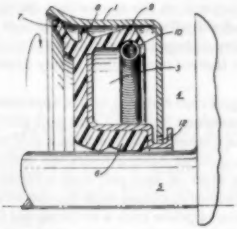
Rolf Drucktenhengst, Lampertheim-Hofheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinhein, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 436,954

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204989

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **9 Claims**



1. A cassette seal for a shaft comprising an inner ring having a substantially L-shaped profile and an outer ring having a substantially L-shaped profile wherein said inner ring is arranged within said outer ring with said L-shaped profiles having an opposed orientation thereby forming an essentially rectangularly bound hollow space;

said inner ring L-shape profile having a first leg extending substantially parallel to the axial direction of said ring with said first leg having an inner surface for facing said shaft;

an elastomer coating adhered to the inner surface of said inner ring first leg for contacting said shaft to provide sealing and support;

said inner ring L-shaped profile having a second leg extend-

ing in the radial direction outward from said inner ring first leg;

said outer ring L-shaped profile having a first leg extending substantially parallel to said axial direction;

said outer ring L-shaped profile having a second leg extending in the radial direction inward from said outer ring first leg; wherein,

the second leg of one of said rings, which will be remote from a sealed-off medium has mounted thereon a member fabricated from an elastomer material with said elastomer member extending into said hollow space and having formed thereon a sealing lip and at least one dust lip;

said sealing lip is positioned within said hollow space and rests against the first leg of said other ring;

said dust lip is spaced from said sealing lip at an axial distance in the direction toward said second leg of said one ring;

the second leg of said other ring which will be adjacent said sealed-off medium is arranged with respect to the first leg of said one ring to form a labyrinth gap for providing restricted fluid communication between said sealed off medium and said hollow space;

means for providing at least one choke point located within said labyrinth gap thereby providing a pumping effect between said sealed-off medium and said hollow space; and

said elastomer member is formed such that the contact surface of said dust lip changes into the contact surface of said sealing lip without enlargement of the diameter.

4,432,558

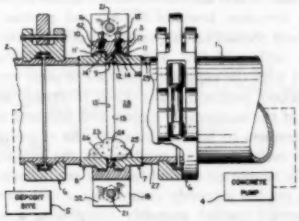
CONCRETE PUMPING SWIVEL COUPLING APPARATUS WITH SEAL

Robert E. Westerlund, 10904 N. Westview, 41W, Mequon, Wis. 53092, and Wayne L. Read, 4913 Hillside Rd., West Bend, Wis. 53095

Division of Ser. No. 866,615, Jan. 3, 1978, Pat. No. 4,305,607, which is a continuation-in-part of Ser. No. 762,381, Jan. 26, 1977, abandoned. This application Dec. 4, 1981, Ser. No. 327,565

Int. Cl.³ F16J *15/00;* **F16L** *27/00*

U.S. Cl. 277—180 **4 Claims**



1. A sealing gasket adapted to be clamped between the ends of a pair of relatively rotatable rigid pipe members, comprising a continuous gasket member having an outer body portion and integral outwardly flared inner side lips, said sealing gasket having an annular recess located between said lips and having a depth substantially less than said sealing lips, said lips being adapted to be deflected inwardly less than the width of said body portion to define a gap adjacent the sidewalls, a rigid spacer member located to the back side of body, said spacer member having a width in excess of said body and less than the distance between the side lips whereby said pipe member may be disposed abutting the ends of the spacer members to define the limits of the deflection of said sealing lips.

4,432,559

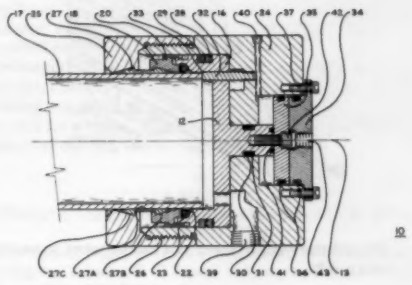
HYDRAULIC CHUCK HAVING RING COLLET

Robert Rasmussen, 3800 - 56th Ave. N., Minneapolis, Minn. 55429

Filed Dec. 16, 1981, Ser. No. 331,324

Int. Cl.³ B23B *31/30;* **B65D** *45/32;* **F16L** *21/06*

U.S. Cl. 279—4 **7 Claims**



1. A hydraulic chuck device, comprising:

a piston having a central axis and an annular extention along said axis with an inner diameter sized to receive a tube;

seal cone means positioned adjacent said extension to cooperatively define a seal cavity adjacent said tube;

seal means located in said cavity to prevent passage of fluid between said piston and said tube;

ring collet means attached to said seal cone means and positioned to engage said tube upon compression of said ring collet means;

body means slideably mounting said piston to permit movement of said piston with respect to said body means along said axis, said body means having tube seat means for restraining axial movement of said tube in one axial direction;

nose cone means fixedly mounted on said body means and attached to said ring collet means such that movement of said body means with respect to said piston operates said ring collet means;

power means for moving said piston with respect to said body means to activate said seal means and said ring collet means; and

said tube seat means fixedly mounted on said body means and slideably mounted through said piston, said tube seat means being positioned to contact the end of said tube to prevent axial movement of said tube in one axial direction.

4,432,560

SINGLE WHEEL GOLF CADDY

James F. Patrick, 106 Imperial Southgate, Lakeland, Fla. 33803

Filed Sep. 28, 1981, Ser. No. 305,958

Int. Cl.³ B62B *1/26*

U.S. Cl. 280—47.19 **9 Claims**

1. A golf club caddy comprising:

a bicycle wheel having a pneumatic tire mounted thereon, and an axle;

a generally U-shaped framework disposed over said wheel and tire and bolted to said axle on each side thereof;

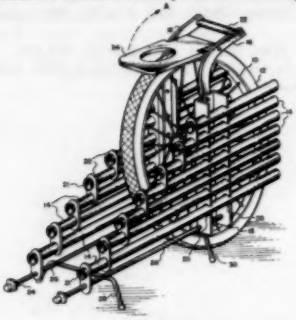
a plurality of golf club holding tubes disposed essentially horizontally in a first bracket attached to a side of a first leg of said frame on one side of said wheel and tire, and in a second bracket attached to a side of a second leg of said frame on the other side of said wheel;

golf club head holding means disposed at the forward ends of said tubes, said tubes having said forward edges staggered to provide separation of the golf club heads;

caddy stand means for supporting said caddy at rest; and

handle-seat means pivoted within an upper portion of said

frame, said handle-seat means pivoted forward to rest upon said tire when said caddy is at rest forming a seat and



pivoted rearward to serve as a handle when transporting said caddy.

4,432,561

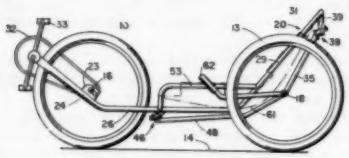
TRICYCLE RECUMBENT

Roger H. Feikema, and Harry J. Bakker, both of 6050 Palmer Blvd., Sarasota, Fla. 33582

Filed May 4, 1982, Ser. No. 374,694

Int. Cl.³ B62K *5/04, 17/00*

U.S. Cl. 280—281 LP **7 Claims**



1. A pedal-powered wheeled vehicle, comprising:

a single front wheel and two rear wheels in triangular relationship, the rear wheels mounted on a common axle;

a passenger cradle having a torso-holding frame;

means for support of the frame on the front wheel in an angled attitude extending upwardly and to the rear of the front wheel;

a first pivot and frame means for pivotally supporting the cradle on the rear wheels at a position rearward and upward from said front wheel;

the first pivot, the front wheel, and the torso-holding frame aligned to enable the cradle to swing about an axis intersecting the ground area projection of the front wheel diameter;

rear wheel stabilizing means including a second pivot carried by the torso-holding frame and tie rod means for rigidly securing the rear wheel axle to the second pivot, the second pivot being aligned to turn about the axis of the first pivot;

whereby the vehicle is caused to steer by rolling of the cradle to tilt the front wheel, but the rear wheels experience essentially no guiding turning.

4,432,562

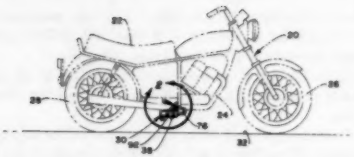
MOTORCYCLE JACK STAND

Jack B. Cline, 12827 Bromwich St., Arleta, Calif. 91331

Filed Jul. 9, 1982, Ser. No. 396,826

Int. Cl.³ B62H *1/02, 1/06*

U.S. Cl. 280—300 **20 Claims**



1. A motorcycle jack stand comprising:

a frame adapted to be mounted on a motorcycle;

a first stanchion mounted on said frame, a second stanchion mounted on said frame, said second stanchion being spaced from said first stanchion, both said first stanchion and said second stanchion being movable between a retracted stowage position and an extended usable position;

said first stanchion constructed of a first main member and a first movable member, said first movable member being movable between a first withdrawn position and a first protracted position, said first protracted position being when the free outer end of said first movable member is in contact with a supportive surface;

said second stanchion constructed of a second main member and a second movable member, said second movable member being movable between a second withdrawn position and a second protracted position, said second protracted position being when the free outer end of said second movable member is in contact with a supportive surface;

a first ratchet assembly connected to said first stanchion, movement of said first movable member is permitted only in the direction toward said first protracted position when said first ratchet assembly is in operation;

a second ratchet assembly connected to said second stanchion, movement of said second movable member is permitted only in the direction towards the second protracted position when said second ratchet assembly is in operation;

whereby with said first and second movable members in contact with the supportive surface in their respective first and second protracted positions, reversing lateral movements of the motorcycle causes said first and second movable members to move relative to the respective first and second main members resulting in the motorcycle being partially supported on said first and second stanchions;

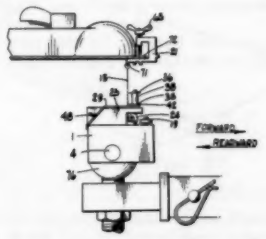
said first ratchet assembly comprising a first pawl assembly, said second ratchet assembly comprising a second pawl assembly, both said first and second pawl assemblies being movable between a disengaged position and an engaged position, with said first and second pawl assemblies in said engaged position each said movable member being capable of movement toward said first and second protracted position, both said first and second pawl assemblies being continuously biased toward said engaged positions; and

retraction means for moving said first and second movable members from their respective said first and second protracted positions to said first and second withdrawn positions, said retraction means including structure to physically engage with said first and second pawl assemblies to move such to said disengaged position.

4,432,563
HITCHING GUIDANCE DEVICE

Laurence S. Pitcher, 1120 N. Logan Ave., Colorado Springs, Colo. 80909

Filed Sep. 10, 1981, Ser. No. 300,932
Int. Cl.³ B60D 1/14
U.S. Cl. 280—477 18 Claims



1. A guidance apparatus to assist the operator of a towing vehicle when maneuvering the towing vehicle to align a hitch element of the towing vehicle with a hitch element of a towed vehicle, the apparatus comprising:

electrical conductor line connectible between the two vehicles;

means, operatively associated with the line, for sensing the relative positions of the towing vehicle hitch element and the towed vehicle hitch element when maneuvering the towing vehicle to align the hitch elements; and

means for detachably mounting the sensing means directly on one of the hitch elements in such a manner that the sensing means will be properly positioned so that additional procedures will not be required to reference the relative positions of the sensing means and hitch elements before using the guidance apparatus, said mounting means comprising:

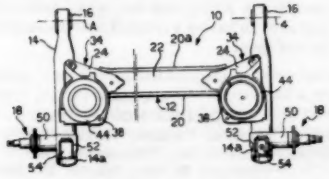
a platform base, which supports said sensing means, and which fits over and matingly engages one of the hitch elements; and

means for detachably securing said platform base to said one of the hitch elements.

4,432,564
REAR SUSPENSION ASSEMBLY FOR MOTOR VEHICLES

Pier G. Tronville, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jan. 5, 1982, Ser. No. 337,203
Claims priority, application Italy, Jul. 22, 1980, 68167 A/80; France, Jul. 21, 1981, 8114143
Int. Cl.³ B60G 19/00
U.S. Cl. 280—689 5 Claims



1. A rear suspension assembly for motor vehicles, of the type comprising a pair of trailing arms with high flexural and torsional strength; a transverse wheel support carried at the rear end of each trailing arm, and a cross member which is flexurally rigid but torsionally yielding and is rigidly connected at its opposite ends to the two trailing arms, the improvement comprising:

said cross member having an inverted U-shaped cross section with an upwardly-disposed base wall having two opposing inclined end portions which slope downwardly towards the trailing arms;

an inverted U-shaped reinforcing member overlying and fixed rigidly to each end of the cross member, each reinforcing member forming a box structure with the corresponding inclined end portion of the cross member,

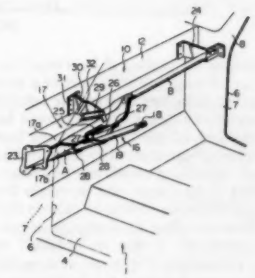
a substantially bracket-shaped connecting part being defined at the outer end of the box structure, in which the respective trailing arm is engaged and fixed by welding, and

a support for a helical suspension spring of the assembly being provided on each reinforcing member.

4,432,565
STEERING ASSEMBLY SUPPORTING DEVICE OF A MOTOR VEHICLE

Ichiro Suzuki, Nagoya; Yasushi Nakagawa, Aichi, and Naoto Kitagawa, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 4, 1981, Ser. No. 327,639
Claims priority, application Japan, May 7, 1981, 56-65029[U]
Int. Cl.³ B62D 1/16
U.S. Cl. 280—779 10 Claims



1. A steering assembly supporting device of a motor vehicle comprising a steering assembly, a floor, front door opening flanges, first and second cowl side panels each extending forward from the front end of a corresponding front door opening flange, front pillars each forming a portion of the corresponding front door opening flange and having a root portion connected to a corresponding cowl side portion, and a cowl inner panel spaced from the floor and transversely extending substantially parallel to the floor at a position above the floor, wherein the steering assembly supporting device comprises:

a steering assembly supporting body spaced from the cowl inner panel and transversely extending substantially parallel to the cowl inner panel, said steering assembly supporting body comprising a hollow tubular portion having an inner end and an outer end, a hollow expanded portion supporting the steering assembly having an inner end and an outer end, a L-shaped bracket having a first and second leg, the inner end of said hollow tubular portion being secured to the inner end of said hollow expanded portion, the outer end of said hollow expanded portion being secured to said second cowl side panel, the outer end of said hollow tubular portion being flattened and fixedly secured to the first leg of said L-shaped bracket, said first leg of said L-shaped bracket being fixedly secured to said first cowl side panel and the second leg of said L-shaped bracket being fixedly secured to said cowl inner panel, said hollow expanded portion having a cross-sectional area which is larger than that of said hollow tubular por-

tion over the entire length of said hollow expanded portion.

4,432,566

SEAT BELT SYSTEM

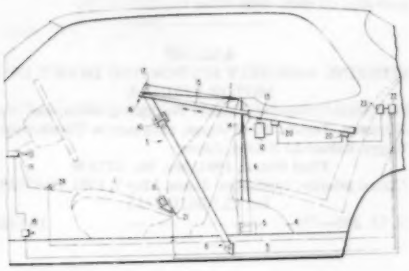
Rudolf Andres, Sindelfingen, and Eduard Ament, Aichwald, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 381,979

Claims priority, application Fed. Rep. of Germany, May 26, 1981, 3120843

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—807 **6 Claims**



1. A mechanism for feeding at least one of a locking means and a belt strap of a safety belt system of a motor vehicle, the safety belt system including a blockable belt roller means, the mechanism includes a displaceably mounted feeder means for feeding at least one of the locking means and belt strap between a retracted position and a forward position for enabling at least one of the locking means and belt strap to be equipped by an occupant of the motor vehicle, means for displacing the feeder arm means between the retracted and forward positions, and means for controlling an operation of the means for displacing, characterized in that an overload safety means is provided for reversing a displacement direction of the means for displacing so as to return the feeder arm means to a retracted position in response to the feeder arm means encountering an unusual rise in force applied thereto during a feeding displacement of the feeder arm means and for automatically initiating a new feeding displacement of the feeder arm means upon the feeder arm means returning to the retracted position, means are provided for enabling a displacement of the feeder arm means from the forward position in a direction of the retracted position by an amount sufficient to release a blocking effect of the belt roller means, and in that means are provided for preventing a restarting of the means for displacing after at least a one-time response of the overload safety means during the feeding displacement of the feeder arm means and a one-time response during a return displacement of the feeder arm means until a source of the force applied to the feeder arm means is removed.

4,432,567

AUTHORIZATION CARD

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Strasse 36, D-7730 Villingen, both of Fed. Rep. of Germany

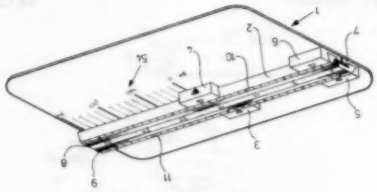
Filed Feb. 11, 1981, Ser. No. 233,332

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005432; Oct. 13, 1980, 8027321[U]

Int. Cl.³ B42D *15/00*; G06K *7/06*

U.S. Cl. 283—83 **7 Claims**

1. An authorization card having at least one storing zone for storing fixed information defining the type and/or extent of authorization and at least one storing zone for storing variable information associated with the owner of said card, said storing zones being adapted for automatic reading of said fixed and variable information in an automatic reading device, and further comprising means for generating a coded information by manual adjustment, said coded information being adapted for automatic reading by said automatic reading device and to be



compared with said variable information, said coded information generating means includes scale means for facilitating said manual adjustment, wherein said coded information generating means comprises at least one zone of electrical resistivity on said card, wherein manually adjustable stop means are in sliding engagement with said zone of electrical resistivity.

4,432,568

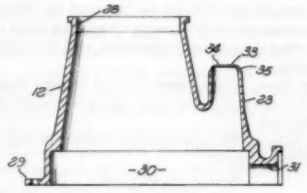
HOUSING FOR GARBAGE DISPOSER

Doru A. Ohannesian, Whittier, and Cyral M. Walsh, Los Angeles, both of Calif., assignors to Norris Industries, Inc., Los Angeles, Calif.

Filed Aug. 31, 1981, Ser. No. 297,576

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—3 **2 Claims**



1. An open upper housing for a garbage disposer and adapted for mounting with a lower housing to provide a grind chamber,

said upper housing having an open bottom and means defining a relatively large sink inlet passage and a relatively small dishwasher inlet spout,

with said sink inlet passage and said dishwasher inlet spout upwardly directed and disposed parallel to each other, and

with said spout including an integral cap closing the inlet end of said spout, said cap having an integral end and an annular rim joining said end to said spout, with said cap end and rim having a reduced wall thickness with respect to said spout.

4,432,569

FLEXIBLE HOSE CHUCK

Robert L. Wietecha, Columbia Heights, Minn., assignor to Air-Mo Hydraulics, Inc., Minneapolis, Minn.

Filed Jun. 25, 1981, Ser. No. 277,289

Int. Cl.³ F16L *21/06*

U.S. Cl. 285—18 **1 Claim**

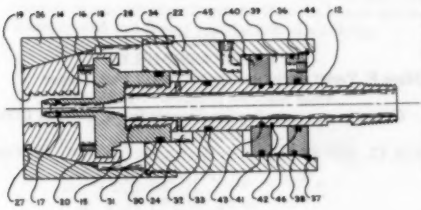
1. A chuck device for use with a flexible hose, comprising:

a porting tube means for attachment at one end to a source of hydraulic fluid and having a central passage for said fluid;

a seal cartridge means removeably mounted on the other end of said porting tube and having a hose engaging cylinder extending away from said porting tube to engage the interior of said hose including seal means for preventing passage of fluid between said hose and said cylinder;

collet means mounted on said cartridge means and positioned to engage the exterior of said hose when said hose is on said cylinder and including biasing means for urging said collets away from said cylinder;

chuck body means slideably mounted between predetermined limits on said porting tube and said cartridge means



10

to define sealed power chamber, said porting tube having a sealed fluid passage means connecting said power chamber to said central passage;

nose cone means mounted on said body means and having a collet means engaging surface, whereby passage of fluid into said chamber forces said collets against said surface to urge said collet against said hose; and

pneumatic clamp means cooperatively associated with said porting tube means to selectively urge said collet means against said surface independent of the presence of fluid in said power chamber.

4,432,570

COUPLING

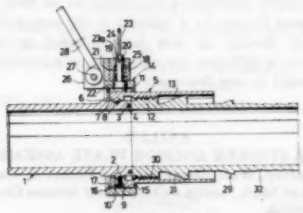
Gunnar Kemppainen, Adolf Hedinsvagen 11, 981 34 Kiruna, Sweden

Filed Jun. 26, 1981, Ser. No. 277,500

Claims priority, application Sweden, Jun. 27, 1980, 8004786

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—24 **3 Claims**



1. A coupling, comprising a first coupling member having a circular toothed portion on the exterior thereof and a second coupling member positioned over said first coupling member and having catch means thereon, said toothed portion cooperating with said catch means of said second coupling member, said first and second coupling members having means therebetween rotatably mounting said second coupling member on and in relation to said first coupling member to permit rotation of the first coupling member by rotating said second coupling member in a circular reciprocating movement, said catch means being reversible such that in a first position thereof it will be engaging the teeth of the toothing to cause said first coupling member to rotate with the second coupling member when rotated in a clockwise direction and to slide over the teeth thereof when rotated in a counter-clockwise direction and in a second position thereof it will cause said first coupling member to rotate with the second coupling member when rotated in a counter-clockwise direction and to slide over the teeth thereof when rotated in a clockwise direction, characterized in that the second coupling member surrounds the toothed portion of the first coupling member, said first coupling member including an elongated sleeve portion extending from said toothed portion and including an internal threading and a smooth cylindrical interior portion extending therefrom to the end thereof, a third coupling member having a substantially smooth tubular exterior guiding portion, and said third coupling member having a threading near to one end thereof threadingly engaging the threading of said first coupling member and at a somewhat larger distance from said end having said guiding portion which inoludes a substantially saw tooth shaped peripheral part, the outer peripheral portion of which closely fits in the cylindrical interior portion of said tubular sleeve to guide said threadings into engagement whereupon said third member is advanced or retracted in said first member by rotation thereof by said second member.

4,432,571

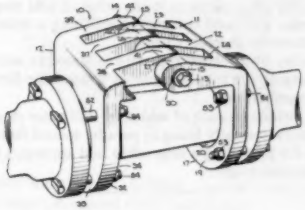
RETAINER GLAND FOR MECHANICAL JOINT PIPE

Samuel H. Davis, 111 Forest Dr., Jericho, N.Y. 11753

Filed Jul. 1, 1981, Ser. No. 279,307

Int. Cl.³ F16L *27/00, 25/00, 21/00, 27/04*

U.S. Cl. 285—283 **11 Claims**



1. A retainer gland for mechanical joint pipe and mechanical joint fittings, the gland including a flat ring portion having a longitudinal axis with two substantially parallel faces perpendicular to the axis and an opening with a circular inner circumference, and a circular rib portion extending generally axially from one face of the flat ring portion adjacent said inner circumference, the flat ring portion and the circular rib portion having a generally L-shaped radial cross section, wherein the retainer gland further comprises:

at least a first hinge arm extending generally axially from the other face of the flat ring portion and terminating in an outer end portion, the first hinge arm having a transverse hole through said outer end portion, said hole being coaxial with a hinge axis which is perpendicular to a plane containing said longitudinal axis of the flat ring portion and there being no axial protrusion from said other face of the flat ring portion that does not intersect said hinge axis.

4,432,572

FLANGE CONNECTION

Alfred Thalmann, Uhwiesen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Mar. 24, 1981, Ser. No. 247,159

Claims priority, application Switzerland, Apr. 9, 1980, 2712/80

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—412 **15 Claims**

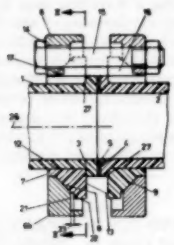
1. An apparatus for connecting a tubular member having a radially protruding collar with a surface generally perpendicu-

lar to the central axis of the member to a fitting or similar member, the apparatus comprising

a first outer flange ring slidable over the collar;

a second inner flange ring having a surface for abutting the perpendicular surface of the collar, said inner ring being unitarily formed from a plastic material with a radial separating slit, at least one thin hinge portion angularly spaced from said slit and an inner cylindrical peripheral surface for surrounding the tubular member;

mating conically shaped surfaces facing each other on said inner and outer rings, said mating conically shaped surfaces being formed such that a line passing perpendicularly through the center of said mating conically shaped



surfaces intersects said inner cylindrical surface of said inner ring;

a plurality of circularly spaced recesses in one of said rings;

a plurality of projections in the other of said rings arranged to mate with said recesses establishing a relative angular relationship therebetween;

a plurality of threaded fasteners mounted in said outer ring for urging the tubular member toward the fitting or similar member; and

a stop surface on each of said inner and outer rings, said stop surfaces normally being in parallel spaced facing relationship for providing a stop when said apparatus is subjected to excessive force.

4,432,573

LOCKING SYSTEM FOR SAFES

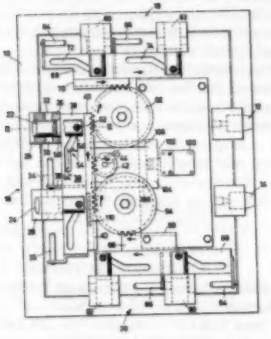
Ilan Goldman, 10 Bar-Eli St., Tel Aviv, Israel

Filed Jul. 22, 1981, Ser. No. 286,002

Claims priority, application Israel, Aug. 8, 1980, 60796

Int. Cl.³ E05B *63/14*; E05C *1/06, 9/10, 9/14*

U.S. Cl. 292—37 **6 Claims**



1. A turnable handle or handwheel operated locking system for safe doors, comprising at least one set of bolts, each bolt being slidable within a fixed bolt housing block between locking and unlocking positions wherein the bolts project into, and are withdrawn from the door rim, respectively, a locking pin for each of said bolts extending normal to the bolt and being in axial alignment with an opening formed at a wall of the said block, a bore formed in the block parallel to the axial direction of said opening, and said pin, the pin being slidably movable in said axial direction and being mounted onto a support member coupled, on the one hand, to the handle and, on the other hand, to the bolts of each bolt set for displacing the bolts into their projected and withdrawn positions, so that in the projected position of each bolt, its associated bore and opening become aligned with respect to each other and the pin becomes inserted through said opening and into said bore for securing the bolt in the locking position.

4,432,574

LATCH ASSEMBLY

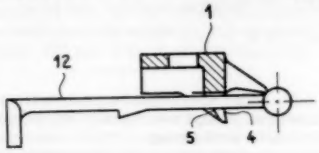
Marc F. Varlet, 8 rue des Ecoles, 56410 Etel, France

Filed Mar. 30, 1982, Ser. No. 363,418

Claims priority, application France, Jul. 4, 1981, 81 07312

Int. Cl.³ E05C *19/06*

U.S. Cl. 292—91 **17 Claims**



1. A latch assembly for limiting the distance that a door may be opened comprising;

a first part, being formed with means to mount said part to one of the door frame and door and being formed with a rigid engagement surface;

a second part, being formed with means to mount said part to one of the door frame and door, and being formed with a base and an outwardly extending flexible arm portion therefrom, and a catch portion extending from said flexible portion, and formed so as to automatically engage the engagement surface of the first part with one part being fixedly mounted on the frame and the other part being fixedly mounted on the door, and with flexure of the arm from the engagement surface, the catch disengages and the door opens; and said flexible arm portion being perpendicularly disposed with respect to its base, and said arm being formed by a cylinder at the outward end, said cylinder having an axis perpendicular to said arm, whereby in different mountings the arm is perpendicular or parallel to said first part.

4,432,575

LOCK STRIKER ANCHOR PLATE ASSEMBLY

Louis P. Garvey, West Bloomfield, and Robert A. Maye, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1982, Ser. No. 346,482

Int. Cl.³ E05B *15/02*; F16B *37/04, 39/28*

U.S. Cl. 292—341.18 **1 Claim**

1. An adjustable lock striker anchor assembly comprising,

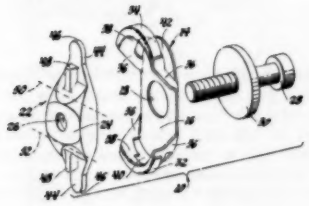
a retention bracket having a mounting portion, a pair of opposed laterally spaced retention flanges extending substantially normally to the mounting portion of the retention bracket and symmetrical with respect thereto,

each retention flange having a slot therethrough defined by the planar mounting portion, a pair of side struts and an upper bridging portion, the slot of one retention flange being sized larger than the slot of the other retention flange, the struts of at least one flange being flexible to

permit the bridging portion of the flange to flex laterally of the mounting portion,

an anchor plate having a central body portion and a pair of legs extending laterally thereof, each leg terminating in an edge portion spaced laterally of the edge portion of the other leg by a distance greater than the lateral separation of the bridging portions of the retention flanges, each leg being slidably receivable through the slot of a retention flange to retain the anchor plate within the retention bracket,

the central body portion further including a pair of sections, each being sized larger than the slot of the said one retention flange, and each spaced from a remote leg edge portion by an amount slightly greater than the lateral spacing between said one flange and the said other flange,



the central body portion further including a pair of ribs intermediate each said leg edge portion and said section and sized smaller than the slot of said one retention flange but larger than the slot of said other retention flange,

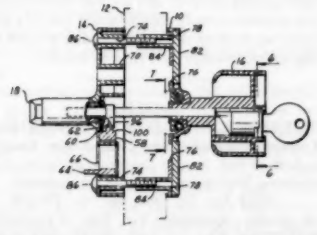
the anchor plate being assembled within the retention bracket by sliding either leg and rib through the slot of the said one retention flange in one direction until a central body portion section engages the said one retention flange and the edge portion of the other leg engages the bridging portion of the other retention flange, the edge portion being resiliently forced past the bridging portion of the other retention flange and into the slot thereof as the struts thereof flex laterally of the mounting portion of the retention bracket, the anchor plate being more closely slidably confined within the retention bracket in the other direction by the engagement of a rib with the said other retention flange.

4,432,576

DOOR LATCH

George Wartian, East Detroit, Mich., assignor to Wartian Lock Co., St. Claire Shores, Mich.

Filed Sep. 28, 1981, Ser. No. 306,288
Int. Cl.³ E05C 21/00
U.S. Cl. 292—357 **4 Claims**



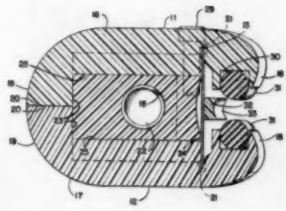
1. A door latch for storm and screen doors having a pair of pre-drilled bolt receiving openings therein by means of which the latch is secured to the door; comprising a pair of latch housings adapted to be mounted on opposite sides of the door, an operating handle carried by each housing and latch mechanism cooperatively associated with and operable by said handles, one of said housings having a plurality of openings therein, the other of said housings, having a pair of inserts each having an outer portion seated in a correspondingly shaped recess in said other housing and an inwardly extending internally threaded mounting post, said mounting posts being insertable through said openings in said door for receiving bolts insertable through aligned openings in said one housing, each insert being reversible end-for-end within its recess and having its mounting post located nearer to one end thereof than the other so that end-for-end reversal of said inserts will vary the spacing between said mounting posts thereby to adapt said latch for use on doors having differently spaced bolt openings therein.

4,432,577

PHONOGRAPH RECORD HOLDING DEVICE

Russell E. Equitz, Jr., 252 Mariposa, #B, Sierra Madre, Calif. 91024, and Bruce K. Strong, 7535 Sunstone Ave., Cucamonga, Calif. 91730

Filed Apr. 5, 1983, Ser. No. 482,178
Int. Cl.³ B65G 7/12
U.S. Cl. 294—16 **19 Claims**



1. A device for grasping, holding, manipulating and transporting phonograph record discs comprising:

(a) An elongated horizontal upper jaw member having a forward extending front jaw section and a rearward extending jaw extension,

(b) An elongated horizontal lower jaw member having a forward extending front jaw section and a rearward extending jaw extension, said lower jaw member being substantially the mirror image of said upper jaw member and being disposed parallel to and underneath said upper jaw member,

(c) A vertically oriented, horizontally disposed spring strip spanning the width of said upper and lower jaws and joining the inner surfaces of said upper and lower jaws at the vertical plane defining the boundary between the front jaw sections and the rear jaw extensions,

(d) A longitudinal channel behind the spring strip spanning the width of the said upper and lower jaws and having symmetrical entrance openings in opposite sides of said upper and lower jaws, said entrance openings tapering uniformly to a smaller-dimension opening towards a plane vertically bisecting said channel,

(e) Opposed actuator buttons slidably mounted in opposite side ends of said channel and having a tapered cross-section substantially conforming to the tapered cross-section of said channel openings,

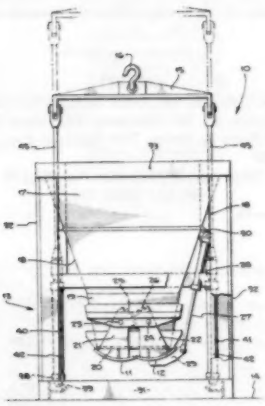
(f) Spring means for maintaining said actuator buttons in outward positions,

(g) Stop means for limiting the outward movement of said actuator buttons, whereby squeezing said actuator buttons towards one another causes said rear jaw extensions to move vertically apart, and said front jaw sections to pivot vertically together.

4,432,578
CLOSED PRESSURE ACTUATED SYSTEM FOR PLACEMENT BUCKET

Roland E. Garlinghouse, P.O. Box 109, Heber Springs, Ark. 72543

Continuation-in-part of Ser. No. 111,227, Jan. 11, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,130
Int. Cl.³ B66C 3/16; F15B 15/17
U.S. Cl. 294—69 R 12 Claims

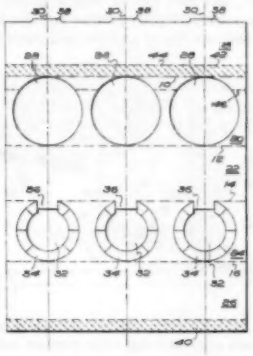


1. A closed fluid pressure actuated system for a material placement bucket equipped with a dispensing gate, operating cylinder means for said gate having opening and closing sides, and piston means in said cylinder means in operating engagement with said gate having full opening and closing strokes, said system comprising a charge of non-compressible hydraulic fluid normally under pressure, lifting means for the bucket, a pressure generating master cylinder assembly having one complementary part attached to the bucket and another complementary part attached to the lifting means and adapted to generate additional fluid pressure, a plurality of traverse lines between said operating cylinder means and said master cylinder assembly, fluid accumulator means in communication with said traverse lines for accumulation of a quantity of fluid under pressure generated by the lifting of said bucket and storage of said fluid, said accumulator means comprising a closed chamber, a first portion of said closed chamber containing compressible fluid under pressure, a second portion of said closed chamber containing a quantity of said non-compressible fluid and diaphragm means comprising a separator between said compressible fluid and said non-compressible fluid, one of said traverse lines being in communication with the opening side of said operating cylinder means and another of said traverse lines being in communication with the closing side of the operating cylinder means, and a primary directional control valve in communication with said traverse lines, said primary directional control valve having a normal position interconnecting said master cylinder assembly and said accumulator means with the closing side of said operating cylinder means and having an actuating position interconnecting said master cylinder assembly and said accumulator means with the opening side of the operating cylinder means.

4,432,579
CARRIERS FOR CONTAINERS

James Denmark, 5 York Pl., Leeds, England (LS1 2SD), and John Shilcock, 11 Wendron Close, Roberttown, Liversedge, West Yorkshire, England

Filed Aug. 18, 1981, Ser. No. 293,933
Claims priority, application United Kingdom, Sep. 19, 1980, 8030433; Feb. 19, 1981, 8015383
Int. Cl.³ B65D 71/00; B66F 19/00
U.S. Cl. 294—87.2 9 Claims



1. A device for holding together groups of containers such as bottles that have a mouth portion with an underside rim or bead, or having caps defining underside rims or beads, which device is produced from cut and creased sheet material which has

an upper wall,

a first side wall,

a lower wall spaced below said upper wall,

a second side wall spaced apart from said first side wall, and

a locking member, the improvement comprising

(1) said lower wall and said upper wall each having apertures through which the top ends of the container can pass so that the mouth portions or caps of the containers extend above said upper wall,

(2) said locking member

(a) having a base portion that is hingedly connected to some portion of the device at a point below said upper wall,

(b) having an upper edge portion that is adapted to extend from a point beneath upper wall upwardly and under the rim or bead of a container, and

(c) being positioned so that it diverges inwardly and upwardly with respect to the sidewall closest to its base portion so that the relationship between said upper wall, said locking member and the side wall nearest the locking member closely approximates that of a triangle, thus ensuring locking of the upper edge portion of the locking member under said rims or beads.

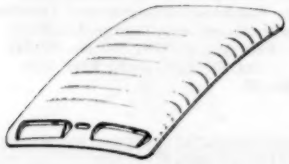
4,432,580
INTERIOR LINING FOR MOTOR VEHICLES

Ernst Lohmar, Weinheim, and Hans-Achim Kunkel, Reichelsheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 275,015
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 8023225[U]; Aug. 30, 1980, 8023224[U]; Aug. 30, 1980, 8023226[U]
Int. Cl.³ E04B 1/74
U.S. Cl. 296—39 A 8 Claims

1. An interior side wall lining for a motor vehicle, which

comprises: a layer of a directly cross-linked, closed-cell-foamed composition of polypropylene in mixture with 10% to 25% by weight polyethylene, laminated to a cover layer selected from the group consisting of a polyolefin sheet, a fabric of a nonwoven or woven construction and a two layer combination of the sheet and the fabric, wherein the foam layer has a volumetric weight of 50 to 175 kg per cubic m; the direct



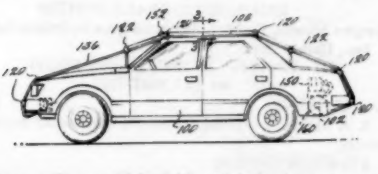
cross-linking is by carbon-carbon single bonds between substantially all of the linear polypropylene and polyethylene molecules used in the composition such that substantially all molecules are cross-linked at least once; and the balance between amorphousness and crystallinity of the composition is sufficient to make the composition flexible and sound absorbing yet allow it to retain its shape at a temperature up to about 120° C.

4,432,581

PORTABLE AUTOMATIC CARPORT

Tesfa Guma, 7709 Newcastle Dr., Annandale, Va. 22003

Filed Jan. 4, 1982, Ser. No. 336,582
Int. Cl.³ B60J 7/20
U.S. Cl. 296—136 **27 Claims**



1. A cover for a vehicle, said vehicle having a passenger compartment, said cover comprising:

cover means attached to said vehicle;

a plurality of brackets attached to the upper surface of said vehicle;

means, attached along substantially the entire length of said cover means, for guiding said cover means over said brackets, said guiding means including a first portion attached to said cover means and extending through at least a part of each of said brackets and a second portion, attached to said first portion opposite said cover means attachment, which cannot pass through said at least a part of each of said brackets to slidably lock said guide means to said brackets; and

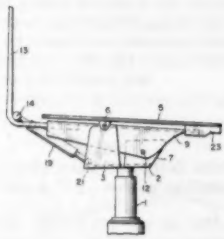
means for extending and retracting said cover means, said cover means for covering the length of said passenger compartment when said cover means is fully extended.

4,432,582

CHAIR WITH MEANS FOR ADJUSTING THE INCLINATION OF THE BACKREST

Herbert L. Wiesmann, Hameln, and Erich W. Becker, Springe, both of Fed. Rep. of Germany, assignors to Wilkhahn-Wilkening & Hahne GmbH & Company, Bad Munder, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,790
Int. Cl.³ A47C 1/02
U.S. Cl. 297—316 **34 Claims**



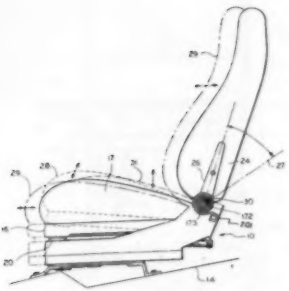
1. A chair comprising a seat portion, a backrest portion, support means for supporting the seat portion, and a cylinder-piston means for enabling an adjustment of an inclination of the backrest portion with respect to the seat portion, characterized in that means are provided for mounting the seat portion at the support means so as to fix a normal setting of inclination between the seat portion and the backrest portion, first means are provided for mounting a first end of the cylinder-piston means to the backrest portion including a bearing shaft means, means are provided for mounting the bearing shaft means to the chair so as to enable the bearing shaft means to be easily removed including a threaded coupling comprising a threaded portion provided along at least a portion of an axial length of the bearing shaft means, and bearing sleeve means mounted in the chair and provided with an internal threaded portion cooperable with the threaded portion of the bearing shaft means, second means are provided for mounting a second end of the cylinder piston means to the chair including a coupling member extending transversely of the seat portion, the coupling member including a pair of axially spaced end portions, coaxially disposed bearing means are respectively provided in each of the end portions, bearing support means are accommodated in the bearing means, the coupling member further includes means for enabling a removal of the coupling member from the bearing support means after a removal of the bearing shaft means including a centrally disposed recess means provided between the end portions for removably accommodating the bearing support means, the coupling member has a substantially cylindrical cross-section and includes one substantially flat outer surface, the recess means is provided in the coupling member on a side thereof opposite the substantially flat surface, the bearing support means includes a pair of bearing pins respectively disposed in the bearing means in the end portion of the coupling member and in the recess means, each of the bearing pins has a substantially cylindrical cross section and includes one substantially flat outer surface, and in that the recess means are dimensioned such that the coupling member is removed from the bearing pins by rotation of the coupling member through a predetermined angle.

4,432,583

VEHICLE SEAT TRACK APPARATUS

Vincenzo Russo, Jackson, and Max O. Heesch, Brooklyn, both of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 1, 1981, Ser. No. 250,065
Int. Cl.³ B60N 1/02
U.S. Cl. 297—330 7 Claims



1. A power seat track mechanism for horizontally moving the seat of a motor vehicle in a forward and rearward sense and for elevating the front end of the seat and elevating the rear end of the seat, the mechanism including laterally spaced apart first and second rail members stationarily secured to the vehicle, a movable carriage comprised of a track member engaged with each rail member for constraining the carriage to forward and rearward horizontal movement, motor drive means for elevating said seat, front elevating structure operated by said motor drive means for elevating the front end of the seat substantially independently of elevation of the rear end of the seat, rear elevating structure operated by said motor drive means for elevating the rear end of the seat substantially independently of any operation of the front elevating structure, a seat back mounted on said carriage for horizontal movement therewith, the mounting of said seat back being independent of both seat elevating structures, a pivotal link at the front end of the seat interfacing between the front elevating structure and the seat, said link having a pivotal mounting to said carriage and to a section affixed to said seat, said link movable about its carriage mounting on operation of the front drive structure to move the front end of the seat upwardly and a limited amount rearwardly during elevation of the front end of the seat, and a second link at the rear end of the seat with one section of the second link affixed to the carriage and a second section spaced from said one section coupled to the rear end of the seat through a lost motion connection to enable said limited rearward movement of the seat on elevation of the front end of the seat, and further comprising a torsion bar at each seat end, each said torsion bar affixed to a link at the respective seat end thereof, and in which there is a bracket supporting the seat adjacent the rear thereof, said bracket including an elongated horizontal slot supporting the torsion bar at the seat rear for effecting said lost motion connection.

4,432,584

TRENCHING MACHINE FOR CUTTING PREFERABLY FROZEN GROUND

Stepan K. Vartanov; Rudolf G. Isupov, both of Leningrad; Vladimir R. Malko, Kharkov; Eino A. Mark, Tallin; Boris I. Kogan, Leningrad; Aref I. Belozerov; Ivan I. Morgachev, both of Moscow; Jury S. Chernik, Leningrad; Konstantin A. Kvitkovsky, Leningrad; Alexei I. Gusev, Leningrad, and Nina A. Terentieva, Leningrad, all of U.S.S.R., assignors to Leningradskoe Nauchno-Proizvodstvennoe Obiedinenie Zemleroinogo Mashinostroenia, Leningrad, U.S.S.R.

Filed Aug. 31, 1981, Ser. No. 297,912
Int. Cl.³ E21C 25/30; E02F 5/06
U.S. Cl. 299—25 4 Claims

1. A trenching machine for cutting preferably frozen ground, comprising:

a vehicle of a tractor type;

a digging apparatus;

a spoil discharge conveyor assembly;

a drive mechanism;

said digging apparatus including:

a boom connected with its one end to said vehicle;

a power means for raising and lowering said boom;

a support and guide means mounted on said boom;

a carrying means moving along said support and guide means;

teeth mounted on said carrying means along each of at least two alternate first cutting lines and second cutting lines in the direction of movement of said carrying means,

the number of said teeth mounted along said first cutting lines being greater than that of said teeth mounted along said second cutting lines,

and the distance between said teeth mounted along said first cutting lines across the width of said carrying means being greater than the width of said teeth mounted along said second cutting lines.

4,432,585

EMERGENCY BRAKE SYSTEM

Kenjiro Nezuka, Kashiwa, Japan, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 29, 1982, Ser. No. 363,191
Int. Cl.³ B60T 7/02
U.S. Cl. 303—10 8 Claims

8. A hydraulic control system for emergency brakes comprising:

a hydraulic reservoir,

a hydraulic pump drawing fluid from said reservoir,

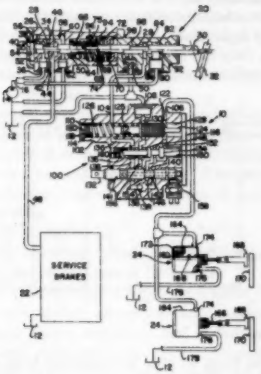
a pilot control valve connected to said hydraulic pump and to said hydraulic reservoir and having a system pressure outlet, said control valve having a first normal position connecting said hydraulic pump to said system pressure outlet and a second selective position connecting said outlet to said reservoir;

a dump valve connected to said pilot valve system pressure outlet having a conduit means communicating inlet pressure to a pressure cavity, said conduit means having a reverse flow check valve, and a valve means inactive in the presence of inlet pressure but, in the absence of inlet pressure, disposed to permit communication between said pressure cavity and a dumping outlet open to said reservoir, said valve means being spring biased to permit communication only above a predetermined pressure differential between said pressure cavity and said dumping outlet;

a pressure-release, mechanical-apply brake actuator having

an inlet communicating with said dump valve pressure cavity and

flow restrictive outlet means communicating with the fluid pressure applied to said brake actuator to permit gradual



decay of said pressure in the absence of inlet pressure to said dump valve and in the absence of communication between said dump valve pressure cavity and said dump outlet.

4,432,586

ANTI-SKID BRAKE CONTROL SYSTEM FOR MOTOR VEHICLES

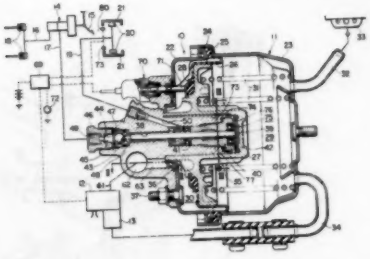
Masamoto Andoh; Harumi Ohhori, and Takashi Kiriyama, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha

Continuation of Ser. No. 188,117, Sep. 17, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,872

Claims priority, application Japan, Sep. 26, 1979, 54-123658

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—115 **8 Claims**



1. A brake control system for a motor vehicle having a master cylinder and brake actuators comprising:

a brake modulator for modulating, in response to a sensed vehicle skid condition, braking effort being applied from said master cylinder to said brake actuators, wherein said brake modulator further comprises;

a housing operatively associated with said brake modulator;

a power piston movable within said housing and forming a first chamber and a second chamber such that said power piston separates said first chamber from said second chamber;

a pressure modulating plunger operatively associated with said power piston;

fluid pressure cut-out valve means for blocking fluid pressure from said master cylinder in response to said sensed vehicle skid condition operatively associated with said pressure modulating plunger;

means for controlling a pressure differential across said power piston which further comprises air passage means disposed between said first chamber and said second chamber; and

a changeover valve for closing said air passage means and for admitting ambient air into said second chamber in response to said sensed vehicle skid condition and wherein said housing further comprises;

guiding means operatively associated with said housing and projecting into said second chamber substantially coaxially with said power piston;

said power piston having a blind force formed therein in sliding fitted engagement with said guiding means;

at least one axial groove formed in the internal surface of said blind bore and extending throughout the full length of said blind bore for continuous communication of the interior of said blind bore with said second chamber through said at least one axial groove; and

lubricant stored within said at least one axial groove.

4,432,587

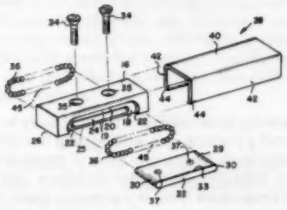
RECIRCULATING BALL BEARING ASSEMBLY

Frank T. Bryan, Greece, N.Y., assignor to Blasius Industries, Inc., Clifton, N.J.

Continuation of Ser. No. 918,070, Jun. 22, 1978, abandoned. This application Oct. 18, 1979, Ser. No. 85,993

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **2 Claims**



1. A recirculating ball bearing assembly for facilitating sliding movement between a pair of objects comprising:

a unitary body having a bottom surface, and an outer side surface substantially perpendicular to said bottom surface;

said body further having a base surface parallel to and spaced from said side surface and extending from said bottom surface, said body further having a smooth continuous outer surface having a substantially straight portion and arcuate end portions, each arcuate end portion having one end integral with one end of said straight portion and its other end lying in said bottom surface, said outer surface arranged perpendicular to and connecting said base surface to said side surface to define a major portion of an outer race, said base surface and said outer surface further cooperating to define a substantially oblong-shaped recess;

a first opening parallel to and spaced from said bottom surface and extending from said base surface through said body to define a body plate;

an inner race plate having a substantially oblong longitudinal cross section insertable through said first opening with an oblong-shaped side portion of said plate extending into said recess wherein the periphery of said side portion forms an endless inner race in register with and spaced from said outer race, said inner race plate further having an enlarged second opening extending therethrough;

means extending through said second opening and engageable with said body plate for adjustably securing said inner race plate to said body;

an endless row of ball bearings mounted in said recess around said endless inner race with a plurality of said ball bearings interposed between said inner race and said major portion of said outer race and the remainder of said ball bearings extending from said inner race beyond said bottom surface; and

a cover plate on said side surface of said body for retaining said endless row of ball bearings in said recess.

4,432,588

BEARING TO BE USED FOR A ROTATING BODY

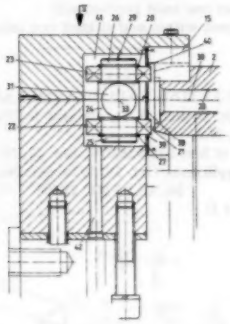
Arnold Kapellner, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 12, 1981, Ser. No. 320,655

Claims priority, application Austria, Dec. 15, 1980, 6083/80

Int. Cl.³ F16C *19/02, 19/50, 35/00, 13/06*

U.S. Cl. 308—234 **3 Claims**



1. A bearing to be used for a rotating body having a rotation surface and a rotation axis, said bearing comprising:

a bearing body having two pairs of opposed pinlike projections extending outwardly therefrom, the axes of all of said projections lying in a common plane, the projections of each of said pairs having a common axis approximately normal to the axis of the other pair, the plane of said axes of said pairs of projections being approximately normal to the axis of said rotating body,

said bearing body being adapted to pivot about the axis of one of said pairs of projections, and

two rolling bodies journaled respectively on the projections of the other of said pairs for rotation about the axis thereof,

said rolling bodies being arranged symmetrically relative to the rotation axis of said rotating body for supporting said rotation surface in the direction of the rotation axis of said rotating body.

4,432,589

MOBILE STORAGE APPARATUS WITH CANTILEVERED LIGHT FIXTURES

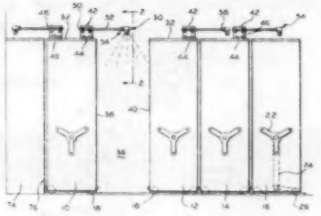
John A. Sattel, Janesville, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Oct. 1, 1981, Ser. No. 307,400

Int. Cl.³ A47B *53/00;* **B60M** *1/34*

U.S. Cl. 312—198 **3 Claims**

1. In storage apparatus comprising a plurality of mobile storage units, each unit having at least one storage face, and guide means cooperating with said mobile units to guide movement of said storage units in a direction normal to said faces and said storage units being movable to open an aisle between adjacent units for access to said faces, the improvement comprising light fixtures, supporting means adjustably supporting said fixtures on top of said units to position said light fixtures in cantilevered relationship from one unit above an adjacent unit when the units are closed so that there is no interference between the light fixture and the adjacent unit during relative movement of the light fixture and adjacent unit upon opening of an aisle over which said lighting structure extends and so that the light thereon will illuminate the adjoining faces of adjacent units when the units are separated to form an aisle and wherein said light fixtures project a distance from the units upon which they are supported a distance equal to approximately one-half of the distance between units when the units



are opened to form an aisle to illuminate both exposed shelf faces, and in which adjacent storage units have lighting fixtures and said lighting fixture from one unit extends over the adjacent unit, with said supporting means being offset from the longitudinal centerline of the mobile units toward the face of the unit to be illuminated by the unit light fixture to provide clearance between the supporting means of one unit and the overhanging lighting fixture of another unit when said units are in closed position.

4,432,590

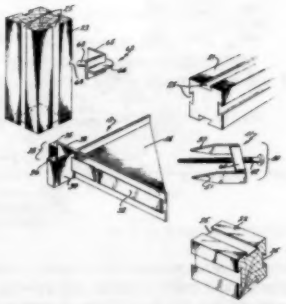
STRUCTURAL SYSTEM FOR SUPPORTING FURNITURE, SHELF AND WALL PANELS

Phillip G. Lawrence, Spring Lake, and Robert L. Russell, Kentwood, both of Mich., assignors to Jer Manufacturing, Inc., Coopersville, Mich.

Filed Dec. 22, 1980, Ser. No. 218,780

Int. Cl.³ A47B *43/00, 47/00;* **E04B** *1/00;* **F16B** *12/00*

U.S. Cl. 312—257 SK **39 Claims**



1. Apparatus for constructing a skeletal framework for supporting wall, furniture and structural panels comprising:

a plurality of elongate frame members each having a generally rectangular cross section;

at least one side of each of said frame members having an axially extending slot;

each of said axially extending slots having a cross-sectional shape substantially wider in some areas than the entrance width of said axially extending slots;

a plurality of corner connectors for interconnecting first, second and third frame members extending in different angular orientations;

said plurality of corner connectors each having first, second and third extensions for extending into and engaging axially extending slots disposed on said first, second and third frame members, respectively;

said first and second extensions being provided with a portion roughly corresponding to the cross-sectional shape of said axially extending slots on said first and second frame members;

said third frame member being provided with at least two axially extending slots;

said third extension comprising a bifurcated member having first and second projections extending into said two axially extending slots disposed on said third frame member, said first and second projections at least partially corresponding to the cross-sectional shape of said two axially extending slots;

a plurality of corner locks;

said plurality of corner connectors each having means for receiving one of said corner locks; and

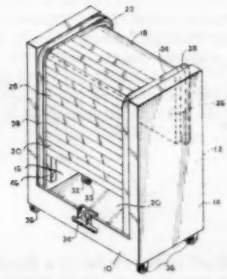
each of said corner locks comprising a stake for extending through said corner connectors and engaging said first and second frame members, and a fastener extending through said stake and said corner connectors, said fastener engaging said third frame member for drawing said first, second and third frame members and said corner connectors theretogether.

4,432,591

STORAGE AND TRANSPORT CART WITH IMPROVED SECURITY

Isaac Rinkewich, Tel-Aviv, Israel, assignor to M.I.T. Poly-Cart Corp., New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,703
Int. Cl.³ E06B *9/14*
U.S. Cl. 312—297 **8 Claims**



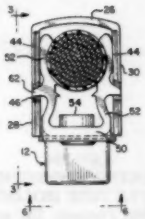
1. A storage and transport cart comprising a body having a wall with an opening, interior and exterior spaced parts defining a track along said opening, said exterior part being recessed relative to the exterior surface of said wall, a relatively flexible door having an end portion situated in and movable along said track between open and closed positions, and interengaging means on said track and said end portion cooperating to prevent removal of said end portion from said track when said door is flexed inwardly, said means comprising first and second lips, said first lip being situated along the edge of said exterior part and extending towards said interior part, said second lip situated along the edge of said end portion and extending towards said exterior part.

4,432,592

ELECTRICAL CONNECTOR ASSEMBLY

Kamal S. Boutros, Downsview, and John W. Fenn, Agincourt, both of Canada, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 21, 1979, Ser. No. 12,986
Int. Cl.³ H01B *7/06*
U.S. Cl. 339—103 M **15 Claims**



1. An electrical connector assembly comprising:

a connector body having a mating section and a terminal section;

a hood including opposing sidewalls for enclosing the terminal section of said connector body; and

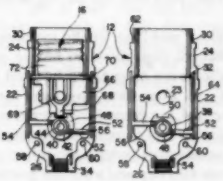
strain relief means on said connector body including opposing clamping members adapted to receive a cable therebetween, said clamping members being resilient and movable in a direction transverse to the axis of the cable placed therebetween from an initial cable-receiving position to a final cable-clamping position, said transverse movement of said clamping members being effected by mounting said hood to its finally assembled position whereby said hood sidewalls urge said clamping members into said final cable-clamping position.

4,432,593

ELECTRICAL LAMP SOCKET HOLDER

Stanley P. Waluk, Attleboro, Mass., assignor to Carol Cable Company, Inc., Pawtucket, R.I.

Filed Feb. 8, 1982, Ser. No. 346,943
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—105 **9 Claims**



1. A holder for an electrical lamp socket and the like comprising:

a. a pair of substantially identical opposed longitudinal casing halves which are formed of an electrical insulating material and which include shell portions that cooperate in assembled relation to define an interior chamber for retaining an electrical lamp socket therein, said chamber communicating with the exterior of said holder through an enlarged upper opening for receiving an electrical bulb or the like in said socket and through a reduced lower opening for receiving a pair of electrical wires connected to said socket, each of said halves further including a hub portion which extends inwardly in substantially aligned relation with respect to the corresponding hub portion of the opposed half, said aligned hub portions abutting interiorly of said chamber, and a pair of longitudinally offset baffles extending outwardly from opposite

sides of said hub portions terminating at the adjacent edges of the respective shell portions, the adjacent baffles of the opposite halves cooperating to define a pair of tortuous paths in said holder on opposite sides of said hub portions for receiving and retaining said wires on opposite sides of said hub portion; and

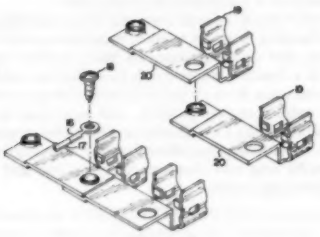
b. means retaining said halves in assembled relation.

4,432,594

CLIP-TOGETHER INTERCONNECTION BUSING CLIP FOR MULTIPLE FUSE HOLDER ARRAYS

Charles W. Daggett, Mt. Prospect, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Oct. 1, 1981, Ser. No. 307,367
Int. Cl.³ H01R *13/12*
U.S. Cl. 339—258 F **21 Claims**



1. A fuse holder array for cartridge type electrical fuses comprising:

a mounting base;

a plurality of spring clips, each said clip including a pair of clip jaws for springingly lockingly engaging a terminal of an inserted fuse, each said clip having unitary terminal lug means; and

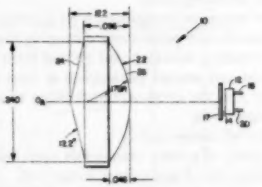
means for securing said clips to clip mounting areas on said base, said secured clips disposed in two parallel rows to form a parallel array of engaged inserted fuses, a chosen plurality of said clips along a given row having their associated termal lug means configured as busing terminals integral with said clips and configured in the form of right-angle conductors comprising a first portion extending away from said clip and a second portion extending at right angles to said first portion such that said second portions of said associated terminal lug means lie substantially along a common axis, each said first portion including an identical first engaging means formed integrally therewith, each said second portion including an identical second engaging means formed integrally therewith, said first engaging means being configured to lockingly engage with said second engaging means by mutal engagement therebetween solely by mechanical deformation of at least one of said engaging means, said first engaging means being disposed at the outer end of said first portion, said second engaging means being disposed at the distal end of said second portion, the length of each said second portion being configured to engagingly join said chosen plurality of clips as a common busing element with said chosen plurality of clips secured to their respective mounting areas.

4,432,595

OPTICAL ELEMENT FOR PHOTOGRAPHIC RADIOMETER

Monis J. Manning, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 99,599, Dec. 3, 1979, Pat. No. 4,335,959.
This application Aug. 31, 1981, Ser. No. 297,774
Int. Cl.³ G02B *5/22*
U.S. Cl. 350—1.1 **12 Claims**



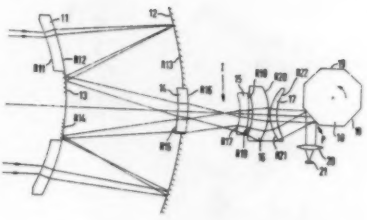
1. An optical element for filtering infrared light comprising at least one metal-organic infrared absorbing dye at least partially dissolved homogeneously throughout a molded optical plastic.

4,432,596

INFRA-RED OPTICAL SYSTEMS

Duncan R. J. Campbell, Dyserth, and Philip J. Rogers, Bodelwyddan, both of Wales, assignors to Pilkington P.E. Limited, St. Helens, England

Filed Jul. 10, 1981, Ser. No. 282,236
Claims priority, application United Kingdom, Jul. 24, 1980, 8024210
Int. Cl.³ G02B *3/00*
U.S. Cl. 350—1.3 **24 Claims**



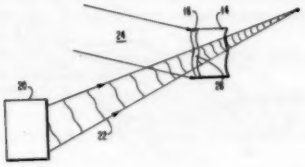
1. An "eye-piece" system for use in a non-Gallilean afocal infra-red optical system or an afocal infra-red telescope in which an intermediate image is formed, the "eye-piece" system comprising at least three lens elements of infra-red transmitting material operative with radiation in at least one of the 3 to 5.5 and 8 to 13 micron wavebands, the three lens elements including a back element of positive power having a front surface which is convex and a curved back surface, and a pair of elements which are closely spaced to define a gas lens therebetween, the back element of the pair having a convex back surface and the front element of the pair having a concave front surface with an absolute value of radius of curvature equal to or greater than that of the convex back surface of the back element of the pair, the pair of elements in combination with the gas lens therebetween being of positive power.

4,432,597

TRANSMISSIVE HOLOGRAPHIC OPTICAL ELEMENT ON ABERRATING SUBSTRATE

Gary C. Bjorklund, Los Alto, and Glena T. Sincerbox, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,093
Int. Cl.³ G02B 5/32; G03H 1/22
U.S. Cl. 350—3.70 8 Claims



1. A method for using a transmissive holographic optical element comprising the steps of

passing a first coherent wavefront through an aberrating substrate and a holographic recording material supported thereon to a wavefront conjugator to launch a conjugate wavefront back toward the holographic recording material,

passing a second coherent wavefront to said holographic recording material whereby said second wavefront interferes with said conjugate wavefront to form a fringe pattern which is recorded in the holographic material,

developing the holographic material to form a holographic optical element, and

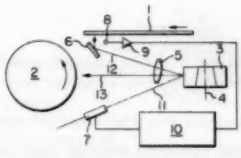
passing a third coherent wavefront having substantially the same wavelength and wavefront shape as said second wavefront through said optical element, thereby resulting in an emerging coherent wavefront conjugate to said first wavefront.

4,432,598

IMAGE READING AND RECORDING APPARATUS AND PHOTODEFLECTOR THEREFOR

Yuichi Akanabe; Hiroaki Ikeda; Masatoshi Maeda, and Shinsuke Funaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1981, Ser. No. 265,350
Claims priority, application Japan, May 22, 1980, 55-67098
Int. Cl.³ G02B 27/17
U.S. Cl. 350—6.7 8 Claims



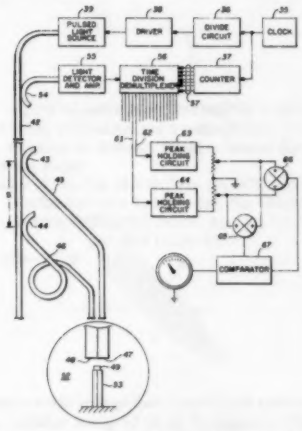
1. A photodeflector for a scanning device, comprising a plurality of groups of multiple mirrors circumferentially alternating around a rotation axis, each of said groups consisting of the same number of mirrors and each of said mirrors of a particular one of said groups being disposed so that its surface is inclined, with respect to said rotation axis, at the same angle as the other mirrors of that group and at a different angle from the mirrors of all other mirror groups disposed about said axis.

4,432,599

FIBER OPTIC DIFFERENTIAL SENSOR

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,615
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.15 7 Claims



1. A fiber optic differential sensor comprising:

main optical propagation means for propagating optical signals in first and second directions;

a plurality of optical directional couplers coupled to said main optical propagation means with predetermined separations therebetween;

a plurality of branch optical waveguides respectively coupled to said plurality of optical directional couplers to receive portions of optical signals propagating in said first direction, each having an end face with said end faces arranged in groups, each group having a center and at least two end faces positioned about said center;

mirror means movable with variations in ambient conditions and positioned with respect to said groups of at least two end faces for reflecting at least portions of optical signals emitted from said at least two end faces back thereto for coupling therethrough to said directional couplers for propagation in said optical propagating means in said second direction, said portion of said reflected signal being a function of said positioning with respect to said at least two end faces and said optical signals propagating in said second direction being temporally separated at a reference plane in said main optical propagation means by a time that is a function of said predetermined separation; and

means coupled to said optical propagation means for receiving said reflected signals and for providing indications of relative differences between said portions of said light reflected from said mirror means.

4,432,600

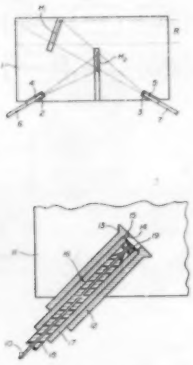
METHOD AND APPARATUS FOR COUPLING AT LEAST TWO OPTICAL FIBERS BY MEANS OF A HOLOGRAPHIC LENS

Lucien Falco, Cornaux, Switzerland, assignor to Cabloptic S.A., Switzerland

Filed Mar. 30, 1981, Ser. No. 249,211
Claims priority, application Switzerland, Apr. 3, 1980, 2677/80
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.18 5 Claims

1. A method of coupling at least two optical fibers by a

holographic coupling lens, comprising the steps of recording a hologram of phase and volume by means of monomodal optical fibers to produce a holographic coupling lens, replacing said monomodal fibers by multimodal fibers, and providing a positioning mechanism for precisely positioning the ends of the multimodal fibers at the position previously occupied by the replaced monomodal fibers.



2. An apparatus for coupling two optical fibers comprising a rigid support arranged to hold in given relative positions monomodal fibers and a holographic coupling lens formed by said monomodal fibers, said rigid support comprising means for pecisely positioning the ends of multimodal fibers to be coupled at a position initially occupied by said monomodal fibers used to form said holographic coupling lens.

4,432,601

APPARATUS AND METHOD FOR COUPLING AND DECOUPLING OF OPTICAL FIBER WAVEGUIDES

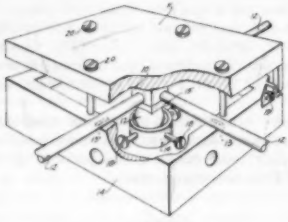
Lothar Mannschke, Eckental, Fed. Rep. of Germany, assignor to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 235,135

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006895

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.19 **17 Claims**



1. An apparatus for coupling and decoupling of optical fiber waveguides to an optical beam splitter comprising a frame for supporting and guiding said fiber waveguides in a plane; a cover plate arranged above said frame, said beam splitter being attached to said cover plate and suspended into said plane, a universal joint arranged below said plane for supporting said beam splitter so tha the latter together with said cover plate are swingable relative to said frame; and means for fixing said waveguides and said beam splitter in an adjusted position.

4,432,602

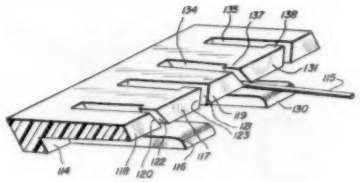
OPTICAL FIBER CLAMP AND CONNECTOR ASSEMBLY

Mark Margolin, Chicago, Ill., assignor to TRW, Inc., Redondo Beach, Calif.

Filed Apr. 13, 1981, Ser. No. 253,777

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 **18 Claims**



1. A retainer assembly for clamping multiple optical fibers comprising opposed arrays of generally parallel flexible cantilever fingers each supported at its proximal end, one of said arrays comprising deflectable first clamping fingers alternatingly interdigitated with latching fingers, the other of said arrays comprising second clamping fingers arranged in opposition to said first clamping fingers, adjacent portions of said first clamping fingers and said latching fingers including cam portions for laterally deflecting distal portions of the respective adjacent latching fingers as the distal portion of each first clamping finger is deflected toward the respective second clamping finger to clampingly engage an optical fiber therebetween and for latch engagement with said first clamping finger to retain said first clamping finger in its deflected clamping position.

4,432,603

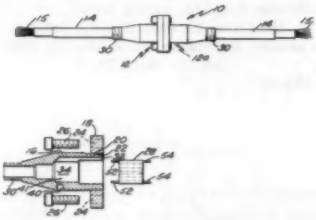
MULTICHANNEL FIBER OPTICS CONNECTOR

Roger L. Morency, Voluntown, and Lester D. Olin, Mystic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1981, Ser. No. 296,285

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **8 Claims**



5. A fiber optic connector assembly comprising:

a first and second connector with each of said first and second connectors having a housing shell, a clamping nut, an insert alignment bushing and anchor pins;

each housing shell having an axially aligned aperture running from the aft end to the forward end of said shell, said shell having fill and exit apertures for potting;

each clamping nut forming a collar around the forward end of its associated shell, each nut having aligned apertures for connecting purposes, the apertures of one nut are clearance apertures and of the other nut are threaded apertures;

each insert alignment bushing being inserted in the forward end of its associated shell, each bushing comprising a solid slug of material having keying pin apertures, anchor pin apertures and fiber optic lead apertures, respective members of said keying pin apertures and said anchor pin apertures having the same axis;

anchor pins inserted in said anchor pin apertures of each insert alignment bushing;

fiber optic leads inserted in each housing shell at the aft end of said axially aligned aperture and connected within said respective fiber optic lead apertures of its associated insert alignment bushing;

potting material surrounding said fiber optic leads within each of said housing shells;

keying pins inserted in respective aligned keying pin apertures; and

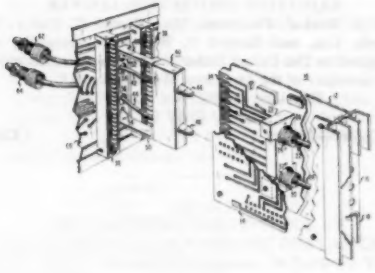
cap screws connecting each clamping nut to each other.

4,432,604

SELF-ADJUSTING FIBEROPTIC CONNECTOR ASSEMBLY

Richard E. Schwab, Randolph, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1982, Ser. No. 372,743
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **5 Claims**



1. A self-adjusting fiberoptic connector assembly capable of movement in three substantially orthogonal directions, said connector comprising:

first and second fiberoptic cable ends terminated in first and second plugs, respectively,

a fiberoptic connector for aligning said first and second plugs,

first means for securing said first plug to a backplane, said first securing means providing for movement of said first plug relative to said backplane in a first one of said orthogonal directions,

second means for securing said fiberoptic connector to a printed circuit board, said second securing means providing for movement of said fiberoptic connector relative to said printed circuit board in a second one of said orthogonal directions, and

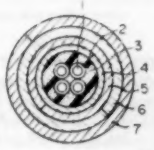
resilient means on one of said first and second plugs for movement of said first and second plugs in the third one of said orthogonal directions when said first and second plugs are inserted in said fiberoptic connector for alignment.

4,432,605

OPTICAL FIBER SUBMARINE CABLE

Yasuhiko Niiro, Yokohama, and Yoshihiro Ejiri, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 24,674, Mar. 28, 1979, abandoned. This application May 1, 1981, Ser. No. 259,529
Claims priority, application Japan, Apr. 11, 1978, 53-41703
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.23 **3 Claims**



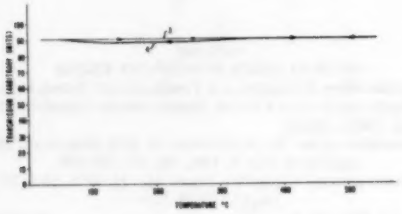
1. An optical fiber submarine cable having a multilayer, cylindrical pressure-resisting layer comprising: at least one optical fiber extending longitudinally; a two-layer cushion layer closely directly covering said at least one optical fiber; said two-layer cushion consisting of a primary thin cushion of elastic material directly covering said fiber and a thicker secondary cushion of soft material, the primary cushion being of a different composition than the secondary cushion material, a cylindrical, tubular multi-layer pressure-resisting layer comprising a first elongated, folded tape of a good electric conductor metallic material folded longitudinally for closely directly, circumferentially covering said cushion layer, a longitudinal joint of side edges of the folded metal first tape being welded; a second tape of a good electric conductor metallic material folded longitudinally closely directly circumferentially covering the layer constituting said first tape and adhered thereto by the use of an adhesive binder layer therebetween; a longitudinal joint of said edges of the longitudinally folded second metallic second tape being welded, the longitudinal welded side edges of the longitudinal joints of the first and second tapes being out of registry, the second metallic tape being thicker than the first metallic tape, a third tape of a good electric conductor metallic material covering and adhered to the second tape and folded longitudinally, a longitudinal joint of side edges of the folded metal third tape being welded and being out of registry with the welds of the first and second tapes, the adhered first, second and third tapes defining a unitary tubular structure and the radius of said cushion layer being substantially equal to the combined thickness of the three of said tapes.

4,432,606

OPTICAL FIBER INSENSITIVE TO TEMPERATURE VARIATIONS

G. Richard Blair, Culver City, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,309
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 **11 Claims**



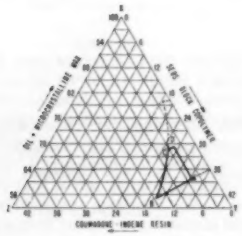
6. An annealed, metal-coated optical fiber comprising at least a light-conducting core and a glass optical cladding thereon, evidencing substantially temperature-insensitive optical transmission.

4,432,607

HOT MELT COATED OPTICAL FIBER

Alvin C. Levy, DeKalb County, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1981, Ser. No. 315,429
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.34 **10 Claims**



1. A coated optical fiber comprising an optical fiber and one or more coated layers thereon,

characterized in that

at least one coated layer comprises a mixture of: (X) An ASTM type 103, 104A, 104B, or mixture thereof, napthenic or paraffinic oil, with a wax optionally substituted for a portion of said oil; (Y) a styrene-rubber-styrene block copolymer having a styrene-rubber ratio of 0.2 to 0.5; and optionally further comprises (Z) a coumarone-indene or vinyl toluene —α methyl styrene copolymer that associates with the styrene end-blocks of said block copolymer; and further comprises a thermal oxidative stabilizer.

4,432,608

VIEWING SCREEN WITH ENHANCED CONTRAST

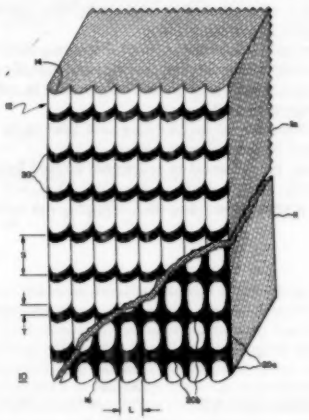
Howard W. Grup, Delanson, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,670
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 **10 Claims**

1. A method for enhancing contrast of a projection screen having a viewable surface, comprising the steps of:

providing a one-piece solid projection screen formed of a substantially uniformly transparent material;

providing the viewable screen surface with a plurality of substantially parallel grooves defining a plurality of substantially parallel lenticule columns therebetween;



depositing a plurality of substantially parallel lines of light-absorbing darkening material only upon the screen viewable surface and in a direction substantially perpendicular to the direction of the lenticules; and

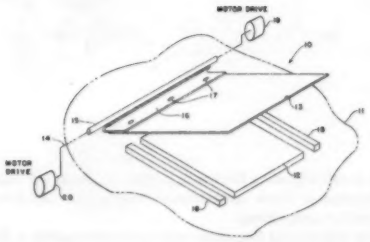
selecting the spacing and thickness of the lines to provide a desired degree of surface coverage.

4,432,609

RADIATION PROTECTION LOUVER

James E. Dueker, Florissant, Mo.; Ronald C. Foster, Fort Worth, Tex., and Bennett V. Whiteson, Wentzville, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 6, 1982, Ser. No. 337,347
Int. Cl.³ E05F 15/20
U.S. Cl. 350—266 **2 Claims**



1. A radiation sensitive protective louver system for shielding a surface from high intensity radiation, comprising:

a. a shaft mounted for rotation about an axis substantially parallel to said surface;

b. a movable louver panel mounted for rotation substantially about said axis;

c. actuator means connecting an edge of said panel to said shaft, for rotating said panel to a position covering said surface in response to heating of said means by high intensity radiation, said means including a metallic alloy member having a predetermined configuration and being formed to an intermediate configuration for installation

into said louver system, said alloy member exhibiting the characteristic of changing from said intermediate configuration to said predetermined configuration in response to said heating; and

d. motor drive means for acting on said shaft to reform said alloy member to said intermediate configuration.

4,432,610

LIQUID CRYSTAL DISPLAY DEVICE

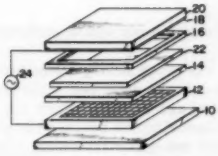
Hiroshi Kobayashi, Tokyo; Hisashi Yamada, and Yukimasa Uchida, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 19, 1981, Ser. No. 235,995

Claims priority, application Japan, Feb. 22, 1980, 55-20542; Jul. 11, 1980, 55-93962; Jul. 11, 1980, 55-93964

Int. Cl.³ G02F 1/133

U.S. Cl. 350—331 R **19 Claims**



1. A liquid crystal display device comprising:

a memory array including a plurality of cells having means for storing data without any external memory for refreshing and for becoming electrically conductive, such that this conductive condition is determined and sustained based on the contents of the stored data;

a data terminal connected to said cells of said memory array and supplied with data to be stored;

an address terminal connected to said cells of said memory array for selecting a cell;

a power source terminal connected to each cell of said memory array;

liquid crystal arranged on the surface of said memory array; and

a transparent electrode arranged on the liquid crystal, holding said liquid crystal with said memory array and applying an electric field to said liquid crystal with said power source terminal through said cells.

4,432,611

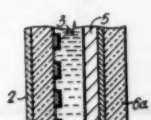
PHOTOCONDUCTOR CONTROL OF ELECTRO-OPTICALLY VARIABLE DISPLAY CELL

John S. S. Wei, Roanoke, Va., assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 948,624, Oct. 3, 1978, abandoned. This application Oct. 24, 1980, Ser. No. 200,138

Int. Cl.³ G02F 1/13

U.S. Cl. 350—342 **7 Claims**



1. A display panel comprising:

a layer of electro-optic material having optical transmissivity increasing with increasing electric field intensity thereacross;

immediately adjacent to the layer of electro-optic material, a layer of photoconductive material having conductivity increasing with increasing light intensity incident thereon;

a first set of conductors contacting the photoconductive material layer on a side thereof remote from the electro-optic material layer;

a second set of conductors located on a side of the electro-optic material layer remote from the photoconductive material layer;

a plurality of crossovers at which conductors of one set cross over conductors of the other set, the crossovers defining a plurality of display cells, each display cell comprising an area of the electro-optic material layer and an immediately adjacent area of the photoconductive material layer located to receive light transmitted by said area of the electro-optic material layer; and

means for applying a voltage between pairs of conductors at selected crossovers;

wherein the electric field intensity-optical transmissivity characteristic of the electro-optic material, the conductivity-light intensity characteristic of the photoconductive material, and impedances of the electro-optic material and the photoconductive material at a selected cell are so related that below a threshold voltage no light is transmitted across the cell, and above the threshold voltage light is transmitted across the cell.

4,432,612

PHTHALOCYANINE ELECTROCHROMIC DISPLAY WITH IMPROVED CYCLE LIFE

Margie M. Nicholson, San Marino, and Frank A. Pizzarello, Yorba Linda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 16, 1981, Ser. No. 302,876

Int. Cl.³ G02F 1/17

U.S. Cl. 350—357 **10 Claims**

1. An electrochromic display cell capable of assuming a plurality of visually distinct optical states and having a cycle life in excess of 50,000 cycles comprising:

a pair of enclosure plates, at least one of which is transparent;

a counter electrode and a display electrode disposed between said enclosure plates;

a layer of electrochromic material disposed on said display electrode, said layer of electrochromic material consisting of an electrochromic diphthalocyanine compound; and

a liquid electrolyte material disposed between said counter electrode and said display electrode, said liquid electrolyte material being specifically selected to be mildly acidic and having a pH between approximately 5 and 2 so as to enable the display cell to function in excess of a 50,000 cycle lifetime, to provide enhanced color contrast, and longer color retention of the red color mode.

4,432,613

EXPOSURE LIGHT BEAMS CONTROL METHOD FOR USE IN A PICTURE REPRODUCING MACHINE

Sadao Ueda, Yasu; Isao Tokura, Uji, and Mitsuhiko Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 10, 1981, Ser. No. 253,049

Claims priority, application Japan, Apr. 10, 1980, 55-47122

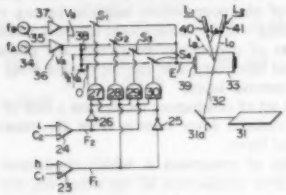
Int. Cl.³ G02F 1/11

U.S. Cl. 350—358 **6 Claims**

1. A method for controlling exposure light beams for use in a picture reproducing machine, said method comprising the steps of:

(a) applying a light beam to an acousto optical deflector deflecting said light beam to form diffracted light beams incident upon a pair of fixed light paths,

(b) digitally controlling said diffraction light beams by applying a variable frequency supersonic wave to said



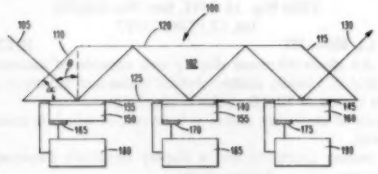
acoustooptical deflector, so that each of said diffraction light beams, respectively, may be made selectively incident upon respective ones of said fixed light paths.

4,432,614

HIGH FREQUENCY LIGHT MODULATOR

William H. McNeill, Carlisle, and Yung J. Chen, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 20, 1982, Ser. No. 451,646
Int. Cl.³ G05D *25/02*
U.S. Cl. 350—386 **13 Claims**



1. An electrooptic device for controlling the intensity of a collimated monochromatic light beam, said device comprising:

a first element transparent to said monochromatic light beam and having first and second planar surfaces operable to alternately reflect said collimated light beam from said first and second planar surface;

a plurality of structures each in contact with said second planar surface at regions where said collimated light beam reflects from said second planar surface, each of said structures forming an interface with said second planar surface;

each of said structures comprising a portion of a material of negative dielectric constant in contact with said second planar surface and a portion of a semiconductor material coupled to said material of negative dielectric constant; and

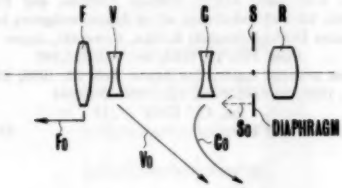
means for separately varying the charge density of semiconductor material in the semiconductor portion of each of said structures to affect the degree of coupling between said monochromatic light beam incident at each of said interfaces and surface plasmon waves generated in each of said plurality of elements whereby the intensity of said collimated monochromatic light beam reflected from the interface at each of said elements varies with the charge density in each of said elements.

4,432,615

ZOOM LENS

Keiji Ikemori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,665
Claims priority, application Japan, Jun. 19, 1980, 55-83065
Int. Cl.³ G02B *7/11*
U.S. Cl. 350—427 **5 Claims**



1. A zoom lens of high grade optical performance comprising:

a first focusing lens group having a lens barrel, a variable magnification optical system and a diaphragm movable along the optical axis from the object side, said variable magnification optical system having a lens group III at the image side, said lens group III having a lens barrel and being movable for variable magnification in such a manner that the distance between the lens group III and the diaphragm is wider at the wide angle position than at the end of the telephoto position,

connecting means, for connecting the diaphragm with the first focusing lens group, said diaphragm being advanced toward the object side in operative engagement with the first focusing lens group when the focusing is changed from an object that is at infinity to an object that is nearby,

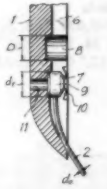
movement prohibiting means for controlling the amount of the movement of the diaphragm operatively engaged with the first focusing lens group at another zooming position than the wide angle position in accordance with the position of the lens group III on the optical axis.

4,432,616

FRAME FOR A PAIR OF SPECTACLES

Yoshinori Kurosaka, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,902
Claims priority, application Japan, Apr. 27, 1981, 56-63743
Int. Cl.³ G02C *1/04*
U.S. Cl. 351—106 **19 Claims**



1. A frame for a pair of spectacles including a rim and lens, comprising:

a peripheral groove formed in the edge of said lens, a first portion of said groove being engaged with a protruding portion of said rim;

a flexible wire engaged in a second portion of said groove, said wire in said groove retaining said lens against said rim;

first and a plurality of second engagement means on said rim for holding the respective ends of said wire to said rim;

third engagement means respectively connected to opposite ends of said wire for connection with said first and a selected one of said plurality of second engagement means, lenses of different perimeters being retained between said wire and said rim by selection of said second engagement means for connection of said wire thereto.

4,432,617

EYE REFRACTIVE ERROR MEASURING DEVICE

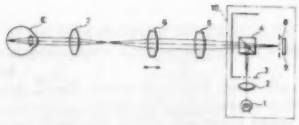
Kiyoshi Itoh, Kamifukuoka; Yukiyasu Nishikawa, Kawagoe; Shuji Hoshika, Fujimi, and Ikuzo Okamoto, Tamagawa, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,221

Claims priority, application Japan, Jan. 30, 1980, 55-9580

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—211 **5 Claims**



1. An eye refractive error measuring device comprising: a chart movable in a predetermined direction in a plane perpendicular to an optical axis of said measuring device, said movable chart having plural striped patterns oriented at different angles from one another; optical system means for projecting the image of said chart onto the retina of an eye to be examined; and means for measuring the refractive error of said eye from a state of said optical system at a position where said image thus projected appears most sharp, said measuring means comprising a stationary chart having patterns similar to said patterns of said movable chart and detecting means, said detecting means receiving light reflected from said retina through said stationary chart.

4,432,618

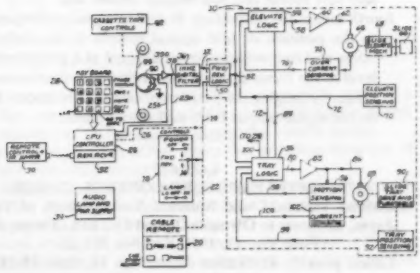
TRAY DRIVE AND SLIDE CHANGE CONTROL APPARATUS FOR SLIDE PROJECTOR

Robert R. Parker, Wheeling, and Rudolph Starai, Arlington Heights, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,523

Int. Cl.³ G03B *23/04*

U.S. Cl. 353—25 **23 Claims**



1. Control apparatus for slide projector apparatus comprising:

drive transport means for carrying a slide tray including a plurality of slide positions and for selectively moving said slide tray to align said slide positions at a slide change station;

means for detecting the position of said drive transport means, said detecting means comprising means responsive to the position of said drive transport means for generating feedback signals representing the degree of alignment between each of said slide positions and said slide change station when each of said slide positions is within a predetermined positional range of said slide change station;

means for generating a slide movement signal; and

drive transport control means responsive to said slide movement signal and said feedback signals for controlling operation of said drive transport means.

4,432,619

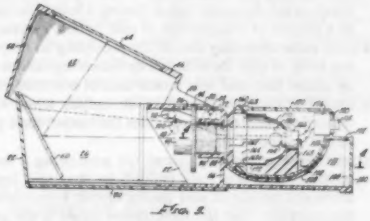
COMPACT COLLAPSIBLE MICROFORM VIEWER

Detlef E. Schmidt, Malibu, Calif., assignor to Topper Manufacturing Corporation, Torrance, Calif.

Division of Ser. No. 237,688, Feb. 24, 1981, Pat. No. 4,358,184. This application May 3, 1982, Ser. No. 373,968

Int. Cl.³ G03B *21/28*

U.S. Cl. 353—119 **2 Claims**



1. A microform projector comprising

a first housing having a lens for projecting an image of illuminated film,

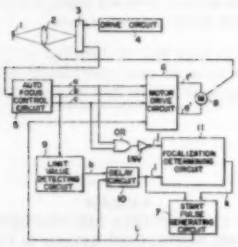
a second housing adjacent said first housing and having means for illuminating film bearing an image to be projected,

said first and second housings defining a film receiving path therebetween, whereby film may be moved and positioned in said path for illumination by light from said first housing, and whereby an image of such illuminated film may be projected by the lens of the second housing, and mutually interengageable means for detachably connecting and readily disconnecting said housings to each other without use of fasteners, whereby said housings may be readily separated and reconnected without tools for maintenance, repair, and cleaning of said film receiving path, said means for detachably connecting comprising first guide means fixed to and extending along said first housing, and second guide means slidably engaged with said first guide means and extending along said second housing, whereby said housings may be relatively detached and reconnected by sliding one of said housings relative to the other, said first housing including an upstanding rear wall positioned behind said film path, said first guide means comprising a first pair of laterally spaced guide members fixed to said rear wall, said second housing having a depending rear wall, said second guide means comprising a second pair of laterally spaced guide members fixed to said rear wall of said second housing.

4,432,620
LENS MOTOR DRIVE DEVICE IN AUTOMATIC FOCUSING CAMERA

Hiroshi Kurokawa, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,318
Claims priority, application Japan, Mar. 13, 1981, 56-36176; Mar. 13, 1981, 56-36177
Int. Cl.³ G03B 3/10
U.S. Cl. 354—402 **3 Claims**



1. A lens motor drive device in an automtic focusing camera, in which current corresponding to a degree of focalization of an optical system is supplied to a lens motor to drive a lens in said optical system; when device comprises:

a signal forming circuit for forming a focalization signal representing the focalization of said optical system, and a focalization deviation signal having a level corresponding to a degree of focalization of said optical system;

a limit value detecting circuit for providing an output when the level of said focalization deviation signal decreases to an extent that said lens motor cannot continue rotation;

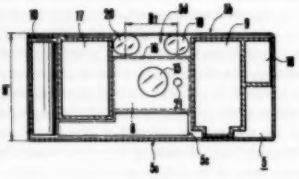
a timing circuit for providing an output when said limit value detecting circuit provides the output for a predetermined period of time; and

a start pulse generating circuit for generating a start pulse having a duration long enough to start said lens motor when the output of said timing circuit is provided under the condition that the focalization signal is not provided, so that current is supplied to said lens motor according to said start pulse.

4,432,621
AUTO-FOCUS BUILT-IN CAMERA

Toyotosi Suzuki; Hideo Tamamura, both of Tokyo, and Mutsuhide Matsuda, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,100
Claims priority, application Japan, Jan. 16, 1981, 56-5639
Int. Cl.³ G03B 3/00
U.S. Cl. 354—403 **8 Claims**



1. A camera having a built-in auto-focus mechanism, comprising:

(A) a film supply chamber;

(B) a film takeup chamber provided at an interval spaced from said film supply chamber;

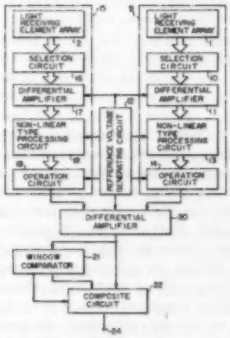
(C) a photographic aperture plate arranged in the space between said film supply chamber and said film takeup chamber and having a total height less that that of said film supply chamber; and

(D) a range finder optical system for said auto-focus mechanism arranged between said film supply chamber and said film takeup chamber at a stepped portion formed by the difference between the total height of said aperture plate and that of said film supply chamber.

4,432,622
FOCUSING-POSITION-DETECTION CIRCUIT

Ikue Kawashima, Iwanuma; Yoshio Fukushima, Machida; Tamio Murano, Itami, and Toshitatsu Suzuki, Takarazuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,826
Claims priority, application Japan, Jun. 16, 1981, 56-92808; Jun. 26, 1981, 56-99198
Int. Cl.³ G03B 3/10
U.S. Cl. 354—408 **3 Claims**



1. A focusing position detection circuit comprising:

two sets of light receiving arrays respectively disposed in front of and behind a predetermined focusing plane of an optical system;

first means and second means for selecting predetermined combinations of two light receiving elements from each of said light receiving arrays, said combinations including combinations of adjacent and non-adjacent light receiving elements, for obtaining the differences in output between said light receiving elements in said combinations, and for subjecting said differences in output to non-linear type processing;

third means for obtaining the difference in output between said first means and said second means; and

fourth means for outputting an analog signal corresponding to the position of said optical system in the defocused range and outputting a focused signal at a predetermined level in the focused range with a predetermined tolerance range, by judging the position of said optical system based on the signal output from said third means.

4,432,623
AUTOMATIC EXPOSURE CONTROL CAMERA

Masafumi Yamasaki, and Muneaki Yoshida, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,231
Claims priority, application Japan, Sep. 22, 1980, 55-132197
Int. Cl.³ G03B 7/08
U.S. Cl. 354—412 **5 Claims**

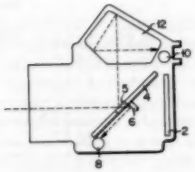
1. An automatic exposure control camera comprising:

light receiving means having first and second photoelectric converting elements which are both in a light receiving

state before the shutter release but only of which is in the light receiving state during the shutter release;

first operating means coupled with said first and second photoelectric converting elements for producing a difference signal output which corresponds to the difference between output signals of said first and second photoelectric converting elements before the shutter release;

second operating means for producing a sum signal of an output signal from said photoelectric converting element



rendered in the light receiving state during the shutter release and said output signal from said first operating means; and

means coupled to said second operating means for controlling an exposure of a camera in accordance with one of an output signal from said second operating means and an output signal from said photoelectric converting element rendered in the light receiving state during the shutter release.

4,432,624

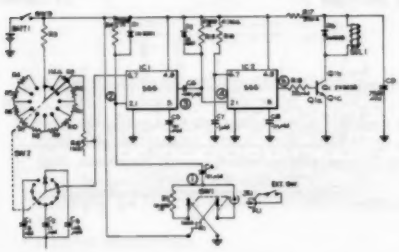
DELAY TIMER FOR A CAMERA

Joan M. Stevenson, Kingston, Canada, and Mark G. Pipkorn, Minneapolis, Minn., assignors to Queen's University at Kingston, Kingston, Canada

Filed Feb. 16, 1982, Ser. No. 349,019

Int. Cl.³ G03B *9/64, 17/40*

U.S. Cl. 354—238.1 **9 Claims**



1. A delay timer circuit comprising:

an externally controlled switch means;

first integrated circuit timer means arranged to provide a first output signal at the end of a selected first delay period initiated by said externally controlled switch means;

variable resistor-capacitor means for selecting duration of said first delay period;

circuit means for connecting said first integrated circuit timer means, through said externally controlled switch means, to a DC power source;

second integrated circuit timer means arranged to provide a second output signal for a predetermined time period initiated by said first output signal;

transistor means activated by said second output signal;

solenoid means arranged to mechanically activate an external load when a current is passed therethrough; and

capacitor means arranged to discharge a current through said solenoid means and said transistor means when said transistor means is activated, and to charge when said transistor means is deactivated.

4,432,625

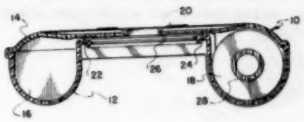
FILM AND PAPER ASSEMBLY FOR FILM CARTRIDGES

Douglass C. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,135

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 **3 Claims**



1. In a roll film cartridge comprising:

(a) a housing including means defining a supply chamber and a take-up chamber spaced from one another by an intermediate cartridge section,

(b) a take-up core rotatably supported in the take-up chamber of said housing, and

(c) a film strip assembly attached at its leading end to the take-up core and comprising a film strip element and an opaque backing strip attached to one another adjacent the leading end of the film strip element, said film strip assembly extending through the intermediate cartridge section and into the supply chamber where it is initially coiled into a supply roll, the improvement comprising;

means connecting the trailing end of the film strip element to the backing strip to prevent relative longitudinal movement therebetween.

4,432,626

SINGLE-LENS REFLEX TYPE VIEWFINDER AND METHOD OF ADJUSTING THE SAME

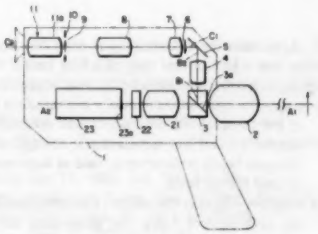
Yoshichi Ohtake, Kamakura, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 15, 1981, Ser. No. 330,863

Claims priority, application Japan, Dec. 16, 1980, 55-177468; Dec. 20, 1980, 55-180840; Dec. 20, 1980, 55-180841; Dec. 29, 1980, 55-185658; Dec. 29, 1980, 55-185659; Dec. 30, 1980, 55-188363

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—155 **14 Claims**



1. A single-lens reflex type viewfinder for a camera, comprising:

a main lens for passage therethrough of light along a first optical axis;

an image pickup device disposed on said first optical axis;

a prism for guiding a portion of the light to pass along a

second optical axis extending substantially at a right angle to said first optical axis;

a viewfinder master lens disposed on said second optical axis for passage therethrough of the light portion;

a mirror for guiding the light portion to pass along a third optical axis extending substantially at a right angle to said second optical axis and parallel to said first optical axis; and

an eyepiece disposed on said third optical axis for delivering a viewfinder image therethrough, said mirror being disposed on an image formation point of said viewfinder master lens so as to eliminate disagreement between the centers of a viewfinder image and an image focused on said image pickup device and also eliminte adjustment of the viewfinder.

4,432,627

APPARATUS FOR COMMUNICATING INFORMATION RELATING TO TAKING LENS

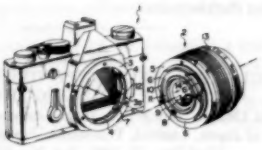
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Oct. 19, 1981, Ser. No. 312,825

Claims priority, application Japan, Nov. 18, 1980, 55-163001

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—289.1 **7 Claims**



1. Apparatus for determining at least one characteristic of a taking lens which forms part of a lens barrel which is removably mounted on a camera body, said apparatus comprising:

a magnetic element stationarily mounted on said lens barrel, at least one of the position of said magnetic element with respect to said lens barrel or the strength of said magnetic element being indicative of said at least one characteristic of said taking lens;

a magneto-electric transducer element stationarily mounted on said camera body for generating an electric signal whose magnitude varies as a function of the magnetic force applied thereto; and

means for positioning said lens barrel at a predetermined location with respect to said camera body when said lens barrel is mounted on said camera body such that the magnitude of said electric signal is indicative of said at least one characteristic of said taking lens.

4,432,628

FILM TRANSPORTATION DISPLAY DEVICE

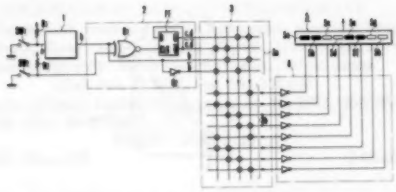
Nobuaki Sakurada; Masayoshi Kiuchi, and Masahiro Thunoda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,691

Claims priority, application Japan, Aug. 27, 1981, 56-134581

Int. Cl.³ G03B *1/66, 17/18*

U.S. Cl. 354—289.12 **7 Claims**



1. A film transportation display device including:

(a) pulse forming means for producing a pulse signal when a film is being transported;

(b) a 1st circuit means for producing a plurality of pulse signals in a prescribed relationship based on the pulse signal from said pulse forming means;

(c) display means for displaying film transporting conditions, said means having a plurality of display elements; and

(d) a 2nd circuit means for actuating the plurality of display elements in said display means to present a display pattern as if it were flowing in one direction based on the plurality of pulse signals from said 1st circuit means.

4,432,629

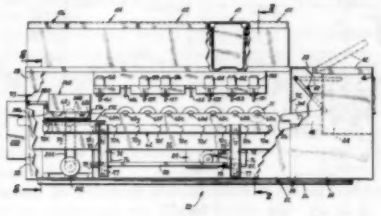
DRYER APPARATUS FOR FILM DISC PROCESSOR

Jerry A. Caflisch, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 5, 1982, Ser. No. 432,819

Int. Cl.³ G03D *5/04, 15/02*

U.S. Cl. 354—299 **29 Claims**



1. A processor for processing undeveloped photographic film discs mounted on a spindle assembly, the processor comprising:

conveyor means for conveying the spindle assembly intermittently along a generally horizontal conveyor path to each of a plurality of processing stations and first and second drying stations, the conveyor means conveying the spindle assembly so that the spindle assembly has an axial direction which is generally horizontal and perpendicular to the conveyor path;

fluid processing means at selected processing stations for contacting the film discs mounted on the spindle assembly with processing fluids;

spindle drive means for rotating the spindle assembly when the spindle assembly is positioned at the processing stations and the second drying station to cause the film discs mounted on the spindle assembly to be rotated at a first rate of rotation;

spindle spin means at the first drying station for rotating the spindle assembly and film discs mounted thereon at a second higher rate of rotation to dry the film discs by centrifugal force;

blower means for blowing tempered air through the drying stations to facilitate film disc drying;

dryer hood means for enclosing the drying stations when the dryer hood means is in a first lowered operational position to prevent fluid from being cast from the spinning film discs into the rest of the processor and to direct the tempered air from the blower means through the drying stations; and

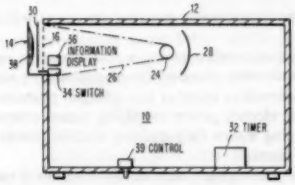
hood movement means for moving the dryer hood means intermittently between its first lowered operational position and a second raised position out of the conveyor path, the hood movement means being synchronized with the conveyor means so that the dryer hood means is moved to its second raised position when the spindle assembly is moved from one station to a next station along the conveyor path by the conveyor means and the dryer hood means is moved to its first lowered operational position when the spindle assembly is positioned at the next station by the conveyor means.

4,432,630

LIGHT SENSITIVE VALIDATING IDENTIFICATION BADGE SYSTEM

David J. Haas, 9 Marget La., Suffern, N.Y. 10901

Filed Oct. 21, 1980, Ser. No. 199,672
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—1 **28 Claims**



1. A temporary security badge fabrication system comprising:

a badge having at least one surface coated with an ambient light sensitive coating which when exposed to ambient light conditions for a specified predetermined period of time changes to a specified color;

an apparatus for printing information on the badge comprising:

a source of radiation;

a printing mask facing the radiation source comprising an opaque portion and a radiation transmissive portion, the radition transmissive portion containing an information portion; and

a badge holding means disposed to locate the mask between the radiation source and the badge holding means; and

a means for activating the radiation source for a period of time sufficient to print the information on the badge in the specified color; and

attachment means mounted to the badge for attaching the badge to a wearer and permitting exposure of the badge to ambient light;

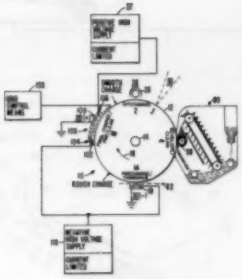
whereby when the badge is attached to the wearer and exposed to ambient light for the specified predetermined period of time the badge changes to the specified color and the information is not discernible.

4,432,631

PHOTOCONDUCTOR CHARGING TECHNIQUE

James L. Bacon, Boulder, and Gerald L. Smith, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 750,800, Dec. 15, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,587
Int. Cl.³ G03G *15/052*
U.S. Cl. 355—3 CH **26 Claims**



1. In a two cycle process, electrophotographic apparatus having a photoconductor with the customary electrophotographic facilities for charging, imaging, developing, transferring and cleaning, the improvement comprising:

a first generator means with a first polarity being positioned in proximity with the photoconductor defining a combined precharge/transfer station;

second generator means with an opposite polarity being positioned in proximity with the photoconductor and downstream from the first generator means for defining a combined final charge/preclean station;

switching means operably associated with said second generator means for controlling the second generator means so as to generate different voltage levels to preclean or final charge the photoconductor.

4,432,632

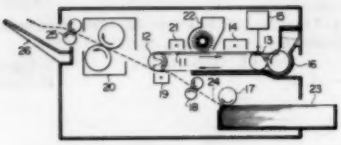
APPARATUS FOR HOLDING A RECORDING MEMBER IN THE FORM OF AN ENDLESS BELT IN A RECORDING SYSTEM USING THE SAME

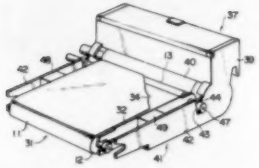
Takashi Yokota, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jan. 11, 1982, Ser. No. 338,606
Claims priority, application Japan, Jan. 13, 1981, 56-3238[U]; Jan. 13, 1981, 56-3239[U]; Jan. 13, 1981, 56-3240[U]
Int. Cl.³ G03G *15/06*
U.S. Cl. 355—3 DD **14 Claims**

9. An integrated assembly of a recording unit including a recording member in the form of an endless belt trained around a plurality of rollers for forming a latent image and a developing unit including a rotatable sleeve for bringing developer to a latent image formed on said recording member to render the

latent image visible, said developing unit having integral means including a receiving portion extending outwardly from said





sleeve for receiving said recording unit and holding the recording member with a predetermined spacing from said sleeve.

4,432,633

ELECTROPHOTOGRAPHIC REPRODUCING APPARATUS

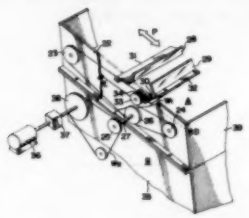
Isao Nosaka; Hirofumi Sakaguchi; Takao Shiozawa, and Yozo Fujii, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,706

Claims priority, application Japan, Feb. 13, 1981, 56-19023

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **11 Claims**



1. In electrophotographic reproducing apparatus:

a pre-assembled optical scanning unit having first components including a movable optical device for reflecting a light beam from a document and means to move said device, said first components having predetermined positions relative to a first plane in said scanning unit;

a pre-assembled reproducing apparatus body unit having second components including a movable electrostatic latent image receptor for receiving said light beam and means to move said receptor, said second components having predetermined positions relative to a second plane in said body unit;

means to mechanically connect both pre-assembled units together so that the first and second planes assume a predetermined positional relationship whereby said light beam forms an undistorted and clear image on said receptor;

and mechanical power transmission means comprising a drivable power supply shaft rotatably mounted on said body unit and drive means connected between said power supply shaft and the said moving means on both of the units.

4,432,634

ELECTROPHOTOGRAPHIC COPYING APPARATUS

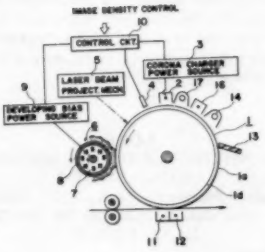
Kenji Tabuchi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1981, Ser. No. 308,173

Claims priority, application Japan, Oct. 20, 1980, 55-147122; Aug. 22, 1981, 56-131922

Int. Cl.³ G03G *15/06, 15/02*

U.S. Cl. 355—14 D **4 Claims**



1. An electrophotographic copying apparatus which comprises:

a photosensitive member having a photosensitive surface;

means for uniformly charging the photosensitive surface of said photosensitive member to a charged potential;

an adjustable electric power supplying means connected to said charging means for supplying electric power to said charging means;

means for projecting light onto the photosensitive surface to form an electrostatic latent image on said photosensitive surface;

means having a developing electrode for reversal development of said electrostatic latent image;

an adjustable developing bias potential applying means connected to said developing electrode for applying a developing bias potential to said developing electrode which is different from said charge potential;

image intensity varying means connected to said electric power supplying means and to said developing bias potential applying means for adjusting at least one of the electric power supplying means and said developing bias potential applying means for varying the intensity of said image; and

control means to which said image intensity varying means is connected and connected to said electric power supplying means and to said developing bias potential applying means for controlling at least the other of said electric power supplying means and said developing bias potential applying means for maintaining an approximately constant absolute value of voltage difference between said charge potential and said developing bias potential in response to an adjustment of at least one of the electric power supplying means and said developing bias potential applying means, whereby the shape of the density variation characteristic curve of the line portions of the image and the shape of the density variation characteristic curve of the solid portions of the image are kept substantially the same.

4,432,635
TEMPERATURE-CONTROLLED SUPPORT FOR SEMICONDUCTOR WAFER

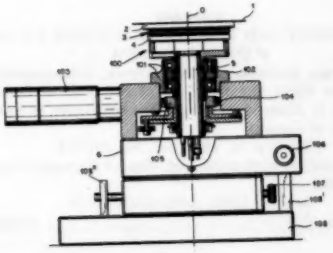
Herbert E. Mayer, Eschen, Liechtenstein, assignor to Censor Patent-und Versuchs-Anstalt, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 188,539, Sep. 18, 1980, and a continuation-in-part of Ser. No. 220,451, Dec. 29, 1980. This application Mar. 31, 1982, Ser. No. 363,860

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951454

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—30 **7 Claims**



1. In an apparatus for exposing semiconductor wafers to exposure through a photomask, comprising a support having a stage with an upper surface onto which a wafer to be exposed is held by suction, said support being displaceable for imparting to said wafer a predetermined alignment position,

the improvement wherein said support comprises temperature-sensing means adjacent said surface and Peltier-effect temperature-control means below said stage responsive to said temperature-sensing means for maintaining said wafer at a selected temperature level.

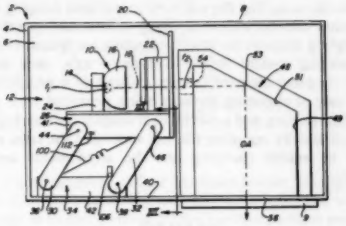
4,432,636
ILLUMINATION APPARATUS

Giuseppe Tarsia, Valley Stream, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,773

Int. Cl.³ G03B *27/72, 27/76*

U.S. Cl. 355—35 **14 Claims**



1. An illumination apparatus for use in an image projection system comprising:

a light source means;

a light sealed housing having a first portion for containing said light source means, a second portion for containing a light mixing means, and a third portion for containing a transparency;

a light mixing chamber selected for insertion into said housing second portion from a plurality of differently sized and interchangeable mixing chambers, said light mixing chamber having a light inlet at one side thereof and a light exit at another side thereof; and

light source positioning means comprising a parallelogram movement for maintaining said light source means at a selected location in optical alignment with said light inlet of a selected light mixing chamber, whereby increased light flux through said transparency is obtained.

4,432,637
APPARATUS FOR THE PREPARATION OF SECTIONS OF PHOTOGRAPHIC FILM FOR PASSAGE THROUGH A CONTINUOUS PRINTER, PARTICULARLY FOR PROCESSING OF PHOTOGRAPHIC PRINT REORDERS

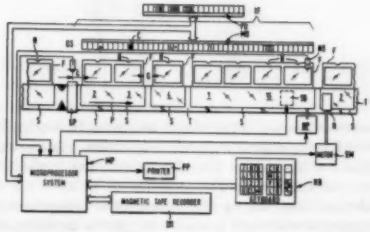
Michael Baschung, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Feb. 22, 1982, Ser. No. 350,569

Claims priority, application Switzerland, Feb. 20, 1981, 1146/81

Int. Cl.³ G06K *7/10, 7/14*

U.S. Cl. 355—35 **8 Claims**



1. Apparatus for the preparation of sections of film for passage through a continuous printer, in particular for the processing of photographic print reorders, including a transport installation for the conveying of film sections mounted on a carrier strip through an inspection section and a device for generating and entering printing data for the individual image frames of the sections of film on a data carrier in coordination with the individual image frames, said device being equipped with a keyboard for entering the printing data and a display for displaying the data entered, wherein at least one part of the display extends essentially along the inspection section, and including electrical means for effecting the display of at least a part of the entered printing data in direct positional coordination with the image frames of the film sections on said part of the display and for causing the printing data appearing on said part of the display to move essentially in synchronization with the transport motion of the film sections, thereby maintaining direct positional coordination of said data with associated image frames of said film sections.

4,432,638
ALIGNMENT STRUCTURE

Giuseppe Tarsia, Valley Stream, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,771

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—63 **32 Claims**

1. An alignment structure comprising:

a column having first track means along one side extending generally the full length thereof and second track means along an opposite side of said column generally coextensive with said first track means;

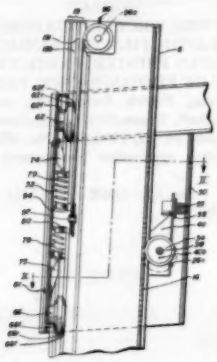
carriage means associated with said column for movement therealong;

first roller means rotatably mounted on an axle transverse to the longitudinal axis of said column, said first roller means

captively journaled in said carriage for movement toward or away from said column;

first bias means urging said first roller means into contact with said first track means;

second roller means including rollers attached to said carriage and in rotational engagement with said second track means, each of said rollers rotatably mounted on an axis transverse to the longitudinal axes of said column and said first roller



means, said second roller means including two spaced-apart rollers fixedly aligned with said longitudinal column axis and a biased roller means laterally spaced and movable with respect to said fixed rollers; and

second bias means urging said biased roller means into lateral engagement with said second track means to maintain said fixed rollers in alignment therewith, whereby the first and second roller means cooperate to maintain said carriage in three-dimensional alignment with said column.

4,432,639

RECIPROCATIVE ORIGINAL CARRIER LOCKING MECHANISM

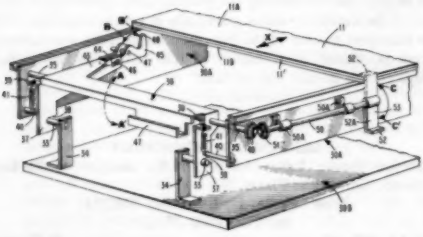
Masao Saitou, Kamakura; Yasuhiro Iwata, Yokohama, and Kohachi Uchida, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,496

Claims priority, application Japan, Oct. 31, 1980, 55-154399

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **4 Claims**



1. An image forming device having an upper and lower unit wherein the upper unit is hingedly attached to the lower unit to permit access to the interior of the machine, the upper unit comprises a reciprocative type carrier which moves along a path of travel which includes a predetermined position, said image forming device comprising:

means for pivotedly attaching said upper unit to said lower unit;

a latching means for latching said upper unit to said lower unit;

a locking means which projects in the path of said carrier to prevent the movement of said carrier from said predetermined position when said latching means is unlatched; and

actuator means having a first portion and a second portion, said first portion being connected to said latching means to operate said latching means, said locking means being connected to said second portion to prevent said actuator means from operating said latching means except when said carrier is in said predetermined position.

4,432,640

ADJUSTMENT AND TESTING DEVICE FOR A LASER RANGING SYSTEM

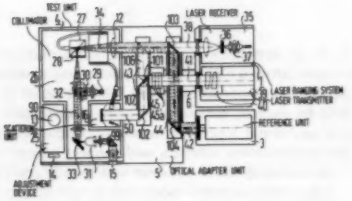
Ludger Grage, Eichenau; Werner Ryseck, Oberschleissheim, and Franz Michl, Geretsried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,401

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034922

Int. Cl.³ G01C *3/08*; G01B *11/26*

U.S. Cl. 356—5 **30 Claims**



1. An adjustment and test device for a laser ranging system particularly adapted for obtaining the parallel alignment of the optical axes of the transmitter and receiver of the system with respect to one another and with respect to an optical reference axis, said device comprising a test unit having a housing, a collimator and means for mounting the collimator in said housing for adjustment of the optical axis of the collimator in said housing, said collimator comprising a collimator lens, a beam splitter cube with a reticule, means for illuminating the reticule and means for observing the illuminating reticule; an optical adapter unit having an independent housing and having means for optically coupling the test unit to the laser ranging system, said optical adapter unit comprising at least one movable optical coupling element for interconnecting an optical axis of the laser ranging system to the collimator axis, each movable optical coupling element having a shape of a parallelelpiped with a pair of opposing surfaces being provided with parallel extending mirrors; and a mechanical adapter unit having means for mechanically coupling the test unit onto the laser ranging system to enable carrying out the adjustments and tests thereon.

4,432,641

VISUAL DEFECT INSPECTION OF MASKS

Fausto Caprari, East Brunswick, and Robert A. Geshner, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,277

Int. Cl.³ G01N *21/88*; G02B *21/08*

U.S. Cl. 356—237 **5 Claims**

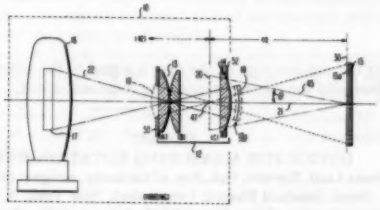
1. A method for visually inspecting specimens of photoresist coated masks having a sensitivity to radiation in the blue and ultra-violet wave length spectrum, comprising:

(a) generating an elongated light source of sodium light said

source of light being substantially free of radiation in the blue and ultra-violet wave length spectrum;

(b) focusing said source in a Kohler-type illumination system within the exit pupil thereof;

(b1) said Kohler-type illumination system having at least three lens elements, comprising two contiguous input lens elements and spaced therefrom one output lens element, wherein an aerial surface of uniform illuminance is located between said three lens elements and the source, an entrance pupil plane is located at the input side of the output lens



element, and an image surface plane is located at the output side of said output lens element;

(c) imaging said light source as an aerial image within the exit pupil of said lens system at an aerial surface that is a conjugate of said light source; and

(d) projecting a substantially uniform illuminance field on a specimen positioned at a plane that is conjugate to said aerial surface of uniform illuminance with sufficiently high contrast levels and illuminance levels to detect with the human eye defects as small as 2 μm by scattering light from said defects.

4,432,642

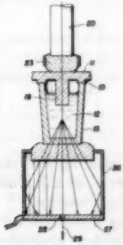
NEPHELOMETER

Walter E. Tolles, Lee Hwy., Fairfield, Va. 24435

Filed Oct. 6, 1981, Ser. No. 309,034

Int. Cl.³ G01N *21/03*

U.S. Cl. 356—246 **4 Claims**



1. In a nephelometer, a fluid specimen holder having at least one micro-volume specimen well including a bottom wall and being open at its top, a cover for the specimen holder overlying the well and having an attached depending light pipe element projecting into the well and being immersed in a fluid specimen contained by the well, precision spacer means on the bottom of the cover abutting a top surface of the specimen holder and establishing and maintaining a precision length light path through the nephelometer between the bottom of the light pipe element and said bottom wall, an additional light pipe means spaced from said cover and said bottom wall in coaxial relationship with said well and light pipe element, and conformable optical coupler means disposed between said additional light pipe means and said cover and bottom wall.

4,432,643

APPARATUS FOR ATOMIZING A SAMPLE INCLUDING A SLIDABLE PRESSURE MAINTAINING ARRANGEMENT

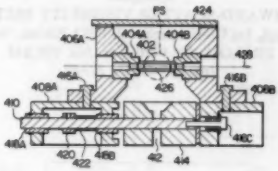
Hideaki Koizumi; Yosio Taiti; Kazuo Moriya; Katsuhito Harada, and Kazuo Sato, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 245,162

Claims priority, application Japan, Mar. 19, 1980, 55-35557

Int. Cl.³ G01N *21/31*

U.S. Cl. 356—312 **8 Claims**



1. An apparatus for atomizing a sample, which comprises a cuvette of heating material into which a sample is introduced, a pair of electrodes for supplying an electric current to the cuvette, thereby heating the cuvette and the sample, and atomizing the sample, supports for supporting the pair of electrodes, a means for supplying light to the atomized sample, and a means for slidably maintaining at least one of the pairs of electrodes against the cuvette with a predetermined range of contact pressure during operation of the apparatus, the means for slidably maintaining at least one of the pair of electrodes against the cuvette in a predetermined range of contact pressure comprising two slide shafts arranged in parallel to each other, each slide shaft having at least one slide bearing, at least one spring stopper being fixed on the slide shaft for pressing at least one of the electrodes against the cuvette, and a spring provided between the slide bearing and the spring stopper.

4,432,644

SPECTROMETER

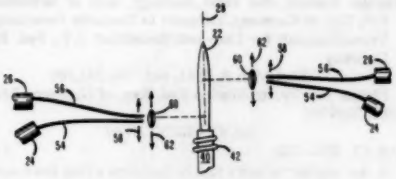
Donald R. Demers, Nashua, N.H., and Charly D. Allemand, Newton, Mass., assignors to Baird Corporation, Bedford, Mass.

Filed Apr. 16, 1981, Ser. No. 254,929

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ G01N *21/73*

U.S. Cl. 356—316 **11 Claims**



1. A fluorescence spectrometer for multielement analysis of samples comprising:

(a) a source for atomizing a dispersed sample along an axis, said source being an inductively coupled plasma;

(b) a plurality of pairs of energizers and detectors mounted

about said source, with each of said pairs for determining one of said elements;

(c) fiber optics interposed between said energizers and said source and between said source and said detectors, said fiber optics being displaceable along said axis of said source; and

(d) a movable optical element mounted between said fiber optics and said source for permitting said pairs to view different segments of said source along its said axis, said movable optical element being a lens.

4,432,645

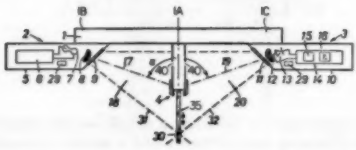
FORWARD-SCATTER VISIBILITY METER

Frank Früngel, Im Glockenacker 2, 8053 Zürich, Switzerland

Filed Oct. 10, 1980, Ser. No. 196,144

Int. Cl.³ G01N *21/49*

U.S. Cl. 356—338 **15 Claims**



1. A forward-scatter visibility meter, comprising:

an elongated support with a center and first and second ends;

a light transmitter located beneath the support at the first end and directing a generally conical beam of light along a first axis which extends downwardly and towards the center;

a light receiver located beneath the support at the second end and receiving a generally conical beam of light along a second axis which extends upwardly and away from the center in a manner that the first and second axes are symmetrical about the center of the support and include an obtuse angle;

a partition attached to the center of the support and extending downwardly therefrom in a manner that all direct transmission of light from the light transmitter to the light receiver is blocked by the partition, said partition having a bottom and a vertical centerline, and being divided at its bottom to form two like downwardly and outwardly extending wings which are symmetrical about the centerline, and wherein each of the wings has a bottom edge and two outside faces, and wherein a rain gutter is located along the bottom edge along each outside face.

4,432,646

ANGULAR VELOCITY SENSOR BASED ON A RING LASER

Rüdiger Rodloff, and Hans Bentlage, both of Braunschweig, Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fur Luft- und Raumfahrt E.V., Fed. Rep. of Germany

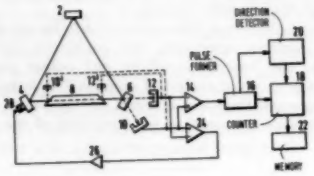
Filed Mar. 9, 1981, Ser. No. 241,701

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009796

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **1 Claim**

1. An angular velocity sensor based on a ring laser comprising two photo-receivers for decoupled beam components of the two oppositely-directed wave trains, an adder for the output signals of the two photo-receivers, a device for stabilizing the length of cavity of the ring laser depending on the sum signal, and a subtractor for the output signals of the two photo-receivers, characterized in that the ring laser is formed in such a way that the angular velocity region to be measured is within the lock-in region, and that a device is provided for determining the size and sign of the output signal of the subtractor to determine the size and sign of the rotational speed.



4,432,647

DEVICE FOR MEASURING ROTATION RATES

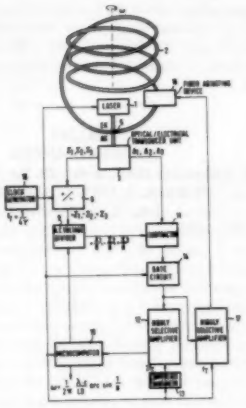
Franz Leitl, Korntal, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 143,825, Apr. 25, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,844

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917442

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—350 **4 Claims**



1. Apparatus for measuring the rotation rate of a rotating mechanical member about an axis, comprising:

a source of pulsed light energy;

first means including a continuous optical fiber having at least one loop coiled generally about said axis and mounted to rotate about said axis with said mechanical member;

second means comprising an optical splitter responsive to said source and operatively associated with said optical fiber at both ends thereof to cause said light energy to propagate in both directions in said optical fiber, said splitter also being operative to heterodyne light energy emerging from said optical fiber ends to generate optical output signals including said heterodyned light energy;

third means responsive to said second means for converting said optical signal output signals to electrical output signals, said third means comprising at least two optical-to-electric signal transducers arranged in juxtaposition and both responsive to said second means light output;

fourth means synchronous with the pulsing of said light

energy source for selecting and passing said third means electrical output signals after said light energy has passed through said optical fiber more than once;

fifth means responsive to said fourth means for evaluating the phase shift between the phases of said second means optical output signals as represented by the corresponding electrical signals at said third means output and corresponding to at least two successive circulations of said pulsed light through said optical fiber to derive a signal which is representative of said rate of rotation;

sixth means comprising summing and differencing circuits responsive to the outputs of said third means transducers for deriving signals representative of the sum and difference of said third means outputs;

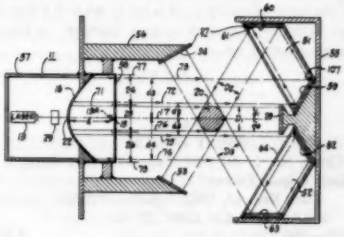
and seventh means responsive to said sixth means output signals for adjusting the amplitude of said difference signals as a function of the amplitude of said sum signal for each value of said difference signal corresponding to a discrete circulation of said light energy through said optical fiber.

4,432,648

MULTIPLE DIMENSION LASER GAUGE

Dominick J. Musto, Middlesex, and Harold Lerner, Fort Lee, both of N.J., assignors to The Austin Company, Cleveland, Ohio

Filed May 18, 1981, Ser. No. 264,477
Int. Cl.³ G01B *11/02, 11/08*
U.S. Cl. 356—387 **10 Claims**



1. A light gauge for noncontact measuring of two different dimensions of an object comprising, in combination,

a parabolic mirror having a focal point along the principal axis of the mirror,

scannable means including means substantially at said focal point mounted to scan said parabolic mirror to cooperate with a plurality of light beams extending from said parabolic mirror parallel to said axis,

reflector means having at least part thereof established in front of said parabolic mirror and positioned to establish the light beams in a plurality of groups of paths including at least first and second groups of paths to scan the object to be measured,

said at least first and second groups of paths being adjacent and non-overlapping,

photodetector means mounted to receive the light beams from said first and second groups of paths after scanning of two different dimensions of any said object,

output means connected to receive the output of said photodetector means,

means actuated in accordance with said scannable means to determine the position thereof and having an output to said output means,

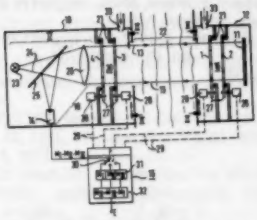
and said output means including means to determine the dimension along two different directions of any object in said groups of paths.

4,432,649

OPTICAL APPARATUS FOR MEASURING TRANSMISSION OR ABSORPTION ALONG A MEASUREMENT PATH

Gerhard Krause, Wachtelweg 26e, 8200 Rosenheim-Egarten, Fed. Rep. of Germany, assignor to Gerhard Krause, Waldkirch, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,469
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022114
Int. Cl.³ G01N *21/59*
U.S. Cl. 356—438 **27 Claims**



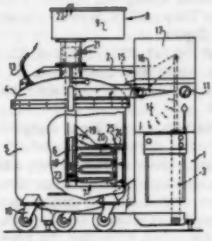
1. Optical apparatus for measuring absorption in a medium, the apparatus comprising a light transmitter for transmitting a light beam along a measurement path through said medium, a light receiver for receiving said light beam from said light transmitter after it has passed along said measurement path to form signals representative of the absorption between the light transmitter and the light receiver along the measurement path, housing means for accommodating said light transmitter and said light receiver, window means for sealingly closing said housing means, means for periodically moving said window means relative to said housing means into and out of said light beam and a processing circuit for computing the absorption of said light beam in said medium from respective signals obtained with said window means in and out of said light beam.

4,432,650

HANDLING DEVICE FOR HANDLING MEAT PORTIONS

Johannes C. Langen, 56 Jan van Cuykstraat, NL-5431 GC Cuyk, and Christianes P. Langen, 11, Zandkampen, NL-5431 BB Cuyk, both of Netherlands

PCT No. PCT/NL81/00013, § 371 Date Dec. 18, 1981, § 102(e) Date Dec. 18, 1981, PCT Pub. No. WO81/03109, PCT Pub. Date Nov. 12, 1981
PCT Filed May 8, 1981, Ser. No. 336,365
Claims priority, application Netherlands, May 9, 1980, 8002714
Int. Cl.³ A23B *4/02*; B01F *7/16, 15/06*
U.S. Cl. 366—147 **11 Claims**



1. A device for processing meat, which comprises a container having a closure lid, stirring means rotatably disposed

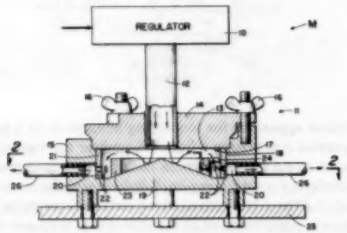
within said container for massaging or mixing meat portions disposed therewithin, said stirring means including a shaft extending axially within said container, drive means for rotatably driving said shaft and said stirring means, control means for comparing the pressure exerted on said drive means in rotating said stirring means with a desired preset pressure, and means for adjusting the inclination of said shaft in dependence upon said pressure exerted on said drive means in rotating said stirring means to maintain said pressure at said preset pressure.

4,432,651

APPARATUS FOR MIXING VAPOR AND LIQUID PHASES OF ANHYDROUS AMMONIA

David M. McLeod, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 4, 1982, Ser. No. 385,194
Int. Cl.³ B01F *3/04*
U.S. Cl. 366—336 **2 Claims**



1. An apparatus for mixing a vapor phase stream of anhydrous ammonia with a liquid phase stream of anhydrous ammonia, to obtain a homogeneous, vapor-liquid mixture of said anhydrous ammonia, the apparatus comprising:

a meter regulator means,

a flow equalizer manifold in communication with the meter regulator means, the manifold includes a circular chamber defined by a top wall, a floor, and a sidewall, the chamber communicates with the meter regulator, the chamber floor has a cone-shaped surface, and the chamber sidewall has outlet openings therein which communicate with a use point;

the manifold includes an orifice sleeve, the sleeve is positioned inside the chamber, it surrounds the cone-shaped surface, it is in contact with the chamber sidewall, and it has openings therein which communicate with the outlet openings in the chamber sidewall;

the manifold includes a flow integrator ring, the flow integrator ring is positioned inside the orifice sleeve, and it seats on the cone-shaped surface of the chamber floor.

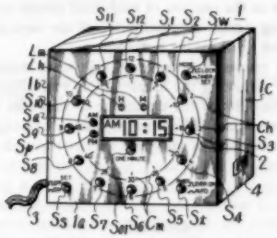
4,432,652

TIMER APPARATUS

Katsusuke Munekata, Kanagawa; Hiroshi Furuno, and Noboru Someno, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,389
Claims priority, application Japan, Feb. 20, 1980, 55-19858
Int. Cl.³ G04C *17/00*; G04F *8/00*
U.S. Cl. 368—69 **5 Claims**

1. A timer apparatus, comprising: a digital time and timer setting display means; circuit means including a plurality of switches for setting a timer working hour; a timer circuit; said switches being connect to operably memorize a timer working hour in said timer circuit and the digital time display means being made indicatable of a timer working hour so that a timer output is obtainable when it reaches the timer working hour; said switches being provided as first through twelfth switches, inclusive, disposed at a positional relation corresponding to one o'clock to twelve o'clock on a dial plate of a clock; switch means for changing-over before noon and afternoon operation; each of the first through twelfth switches corresponding to a respective one through twelve o'clock working hour setting corresponding to the positional relation; said digital time display means being encircled by said first to twelfth switches; a mode change-over means having first and second modes, and when any of said first to twelfth switches is operated in the first mode, an "hour" input corresponding to a position of said operated switch is memorized in said timer circuit as the "hour" of the timer set hour, and when any of said first to



twelfth switches is operated with the second mode, a "minute" input corresponding to a position of said operated switch is memorized in said timer circuit as a "minute" setting; a one-minute switch and a value of the "minute" setting being increased by a number of times said one-minute switch is operated, the "minute" setting being memorized in said timer circuit; and a light emitting device which is luminous when an "hour" of the timer working hour is being set and a light-emitting device which is luminous when a "minute" of the timer working hour is being set.

4,432,653

WRIST WATCH

Wu Ting-Ching, No. 1, Alley 64, Lane 193, Han Sheng E. Rd., Pan Chiao, Taipei, Taiwan

Filed Dec. 13, 1982, Ser. No. 449,564
Int. Cl.³ G04C *21/16*
U.S. Cl. 368—250 **3 Claims**

1. A wrist watch, comprising:

a timing unit having an electric powered time piece circuit capable of providing time information and provided with switches for pre-setting alarm time and being capable of producing an electric pulse at the moment of a pre-set alarm time, and a display unit for showing the time information supplied by said time piece circuit;

an alarm unit having:

a memory unit adapted to receive and convert said electric pulse into a steady electric output;

a switching unit operable by said steady electric output produced by said memory unit to allow electric power to be supplied therethrough;

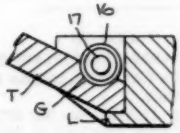
a signal generator capable of transforming an electric power supplied thereto through said switching unit into an intermittent, alternating voltage capable of stimulating people; and

a pair of electrodes to which said intermittent, alternating voltage is supplied, said pair of electrodes being exposed through the back side of the alarm watch.

4,432,654
WRIST WATCH CASE AND METAL BRACELET ASSEMBLY

Bernhard Hesselschwerdt, Cranston, R.I., assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,848
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—282 **5 Claims**



1. A wrist watch and metal bracelet assembly comprising:

A. a metal case for accommodating a watch movement and having ends each provided at its rear face with an elongated notch to define a broad, relatively thin ledge bordered by side fingers whose inner walls each have a cavity therein;

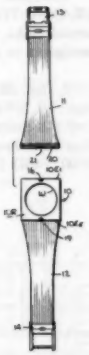
B. a metal bracelet formed by two complementary components which when joined together at their leading ends encircle the wrist of the wearer, each component having a tail receivable in said notch to rest on the ledge which, as seen from the front face of the assembly overlaps the tail to give a soldered look to the assembly, said tail having a transverse groove in its rear face which extends between the fingers; and

C. a retractable cross bar receivable within the groove and having axially extending pins which fit into the cavities of the fingers, the inner walls of the fingers being inclined and the tail having a complementary taper whereby the tail to be received in the notch must be inserted downwardly therein, the inclination of the walls of the fingers preventing longitudinal withdrawal of the tail.

4,432,655
INTEGRATED WATCH CASE AND BRACELET ASSEMBLY

Jack Wollman, Manhasset, N.Y., assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Oct. 13, 1982, Ser. No. 433,964
Int. Cl.³ G04B *37/00*
U.S. Cl. 368;282 **6 Claims**



1. A wrist watch case and bracelet assembly comprising:

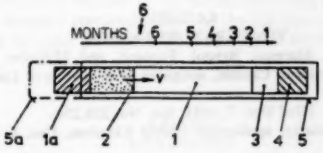
A a case for accommodating a watch movement, said case having straight ends each provided with a longitudinal groove, the rear face of the case having at its midpoint adjacent each end thereof a threaded bore to receive a holding screw which when turned in penetrates the groove; and

B a bracelet formed by two components which when joined together at their leading ends encircle the wrist of the wearer, the tail end of each component terminating in a split pin which is slidable into the groove at the complementary end of the case, said split pin having a mid space between the half pieces thereof which when the pin is in place lies in registration with the bore whereby the screw, when turned in, enters this space to lock the component to the case.

4,432,656
PROCESS FOR MONITORING THE HISTORY OF TEMPERATURE VERSUS TIME OF DEEP-FROZEN PRODUCT, INDICATOR FOR APPLYING SAID PROCESS AND UTILIZATION OF SAID PROCESS

Thomas Allmendinger, Bruggwiesenstr. 7, 8152 Glattbrugg, Switzerland

PCT No. PCT/CH80/00085, § 371 Date Mar. 12, 1981, § 102(e) Date Mar. 12, 1981, PCT Pub. No. WO81/00303, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 11, 1980, Ser. No. 253,748
Claims priority, application Switzeriand, Jul. 13, 1979, 6535/79
Int. Cl.³ G01K *3/04, 11/16*
U.S. Cl. 374—102 **15 Claims**



1. A time temperature integrating indicator for monitoring the history of a deep-frozen product by the diffusion of water along a diffusion path wherein the water front advancement along the diffusion path is a function of elapsed time and of the temperature of the product, the indicator comprising a wick of a material which defines a diffusion path along which water will diffuse; the wick being provided along its diffusion path with citric acid or a mixture of sodium chloride/citric acid or of sodium chloride/sugar, as an absorbing and hydrate forming substance; the formation of the hydrate at least partially providing a visible indication of the water front location; a moisture tight covering enclosing the wick; an opening in the covering for permitting intimate contact between the wick and water on the frozen product, located at the opening in the covering; and additional indicating means for indicating the location of the water front along the diffusion path from the opening in the covering.

4,432,657
PYROMETER METHOD FOR MEASURING SLAB TEMPERATURE IN A REHEAT FURNACE

Eugene M. Rudzki, Bethlehem; Ronald W. Jackson, Emmaus, and Anthony P. Martocci, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 26, 1982, Ser. No. 362,346
Int. Cl.³ G01J *5/16*
U.S. Cl. 374—126 **6 Claims**

1. A method of measuring slab surface temperature in a reheat furnace comprising the steps of

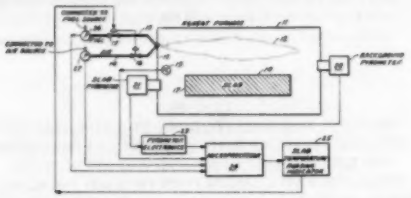
measuring radiation from a slab in the furnace,

measuring wall temperature of the furnace,

measuring air and fuel flows to the heating means of the furnace to determine an air to fuel ratio,

measuring the distance between the slab and the pyrometer used for measurement of radiation from the slab,

choosing a temperature correction function from a list of such predetermined functions in accordance with a combination of the aforementioned measurements of wall temperature, air to fuel ratio, and distance between slab and the pyrometer used for measurement of slab radiation,



obtaining a corrected measurement of the temperature of the slab by correcting said measurement of temperature of the slab in accordance with the chosen temperature correction function which function is a function of temperature differential of the temperature of the furnace wall minus the temperature of the slab surface, distance between measuring pyrometer and slab surface, combustion air to fuel ratio, and emissivity setting of the pyrometer.

4,432,658

TEMPERATURE SENSOR

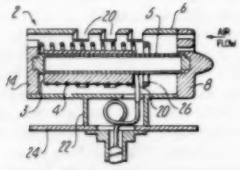
Geoffrey E. Harman, Bristol, England, and Malcolm J. F. James, Ontario, Canada, assignors to Rolls-Royce Limited, England

Filed Dec. 7, 1981, Ser. No. 328,254

Claims priority, application United Kingdom, Dec. 6, 1980, 8039190

Int. Cl.³ G01K *1/08*

U.S. Cl. 374—138 **5 Claims**



1. A temperature sensor for use in an air flow, comprising:

a temperature sensitive element;

a hollow cylindrical casing enclosing said temperature sensitive element, said cylindrical casing having a longitudinal axis disposed generally in line with a direction of said air flow and having forward and rearward open ends;

a front plate facing for partially closing said forward end of said cylindrical casing;

first and second aperture means;

said first aperture means being formed in said hollow cylindrical casing and comprising a plurality of rows of slot-like apertures arranged transversely to said longitudinal axis of said cylindrical casing, each of said slot-like apertures in said cylindrical casing having a relatively small width and a relatively large transverse length and being outwardly forwardly inclined such that said air flow passing over said cylindrical casing is directed into an interior of said cylindrical casing to flow over said temperature sensitive element;

said second aperture means being formed in said front plate facing and comprising a plurality of arcuate slot-like apertures, each of said arcuate slot-like apertures in said front plate facing having a large ratio of perimeter length to cross-sectional area such that air flow can pass easily therethrough while enabling rapid blockage thereof by ice when icing conditions are prevalent in the air flow;

wherein said hollow cylindrical casing further comprises a forwardly extending unapertured portion adjacent to said front plate facing such that any ice buildup occurs between said first aperture means and said front plate facing in the interior of said cylindrical casing.

4,432,659

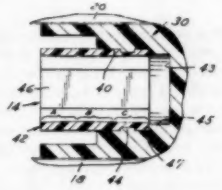
FUEL PUMP ARMATURE SHAFT BEARING

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Mar. 12, 1982, Ser. No. 357,690

Int. Cl.³ F16C *33/02, 35/02, 33/20*

U.S. Cl. 384—300 **1 Claim**



1. In a device having a rotating shaft journalled at one end in a molded plastic portion of a housing, that improvement which comprises a hollow cylindrical bearing insert molded into a recess in said housing and formed of a plastic such as polytetrafluorethylene, said insert having a close running fit with said rotating shaft and shaped internally and externally with a polygonal configuration, the sides of the internal polygon being in running contact with said shaft and the sides of the external polygon being in mechanical engagement with said housing, said insert having a substantial portion of its outer end extending axially out of said recess to the extent of about one-half the axial length, and said insert having a larger diameter at its outer end beyond said recess and at the inner end within said recess in comparison to a smaller diameter at a central section in the area of the mouth of said recess.

4,432,660

GLASS- OR CERAMIC-TO-METAL SEALS

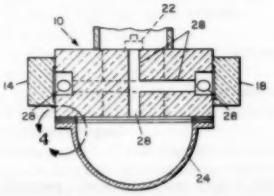
Gordon S. Norvell, Thousand Oaks, and Donald W. King, Pomona, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 105,759, Dec. 20, 1979, Pat. No. 4,273,282. This application Apr. 20, 1981, Ser. No. 255,591

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ F16C *9/00*; F16D *1/00*; F16G *11/00*

U.S. Cl. 403—29 **32 Claims**



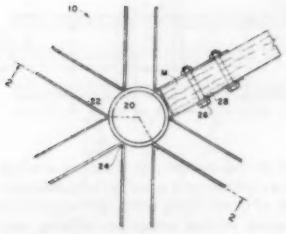
1. A seal between a metal surface and a glass surface comprising in juxtaposition, said metal, gold, an indium-gold alloy, indium, and said glass.

4,432,661

GEODESIC DOME CONNECTOR

Martha E. Phillips, 3906 Ridgecroft Rd., Baltimore, Md. 21206, and Leo G. Woerner, 1301 Woodshole Rd., Baltimore, Md. 21204

Filed Jul. 17, 1981, Ser. No. 284,197
Int. Cl.³ F16B 7/00
U.S. Cl. 403—172 1 Claim



1. In a connector for geodesic domes, having a plurality of pairs of arms radiating from a central tubular portion, each pair of arms in symmetrically parallel-spaced relation about a respective radius of the central portion, and at an axial angle thereto, and having holes in the arms for bolted connection of a respective elongate member between each pair of arms; the connector having a first or outer face and a second or inner face, the improvement comprising: the central tubular portion being a cylindrical tubular member, respective adjacent arms of different pairs being affixed at a respective junction with each other at the perimeter of the central portion, the central tubular portion having a conical convex taper on the axial end thereof at said outer face; and the central tubular portion having a conical concave taper on the axial end thereof at said inner face.

4,432,662

COMPOSITE SUCKER ROD AND METHOD OF MANUFACTURING SAME

Ake E. Ronnkvist, 4484 W. Arm Rd., Spring Park, Minn. 55384

Filed Aug. 13, 1981, Ser. No. 292,636
Int. Cl.³ F16B 11/00
U.S. Cl. 403—271 10 Claims

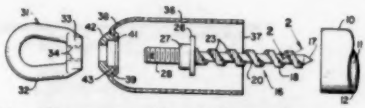
1. A composite sucker rod comprising a first member initially of one piece construction, said first member including a rod portion of one diameter, a bead portion, a wrench portion and a cylindrical portion of larger diameter than said rod portion, and a second member including a cylindrical portion and a threaded portion, said cylindrical portions having substantially the same diameter and being inertia welded to each other.

4,432,663

CABLE PULLING EYE

John L. Lasak, LaGrange Park, and Costenzio A. Turzalino, Elmhurst, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,747
Int. Cl.³ F16G 11/05
U.S. Cl. 403—275 2 Claims



1. A cable pulling eye assembly, which comprises:

a rod having a square auger thread formed along a forward section thereof and a screw thread formed along a rearward section thereof;

a cylindrical shell means having a closed nose end with an opening therethrough for receiving and supporting said rod in coaxial relation with said shell;

an eye member having a threaded bore for threadably receiving the threaded section of the rod; and

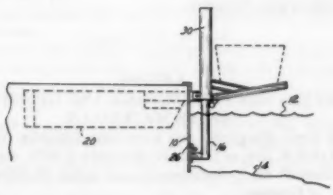
a jam member on said rod positioned within said shell means and jammed into engagement with the inner wall of the closed end of the shell by the eye member being screwed on the threaded rearward section of the rod into engagement with the outer portion of the closed end of the shell means.

4,432,664

BOAT HOIST

Joseph W. Baldyga, Mt. Clemens, Mich., assignor to Duraline Products Corporation, Mich.

Filed Mar. 3, 1981, Ser. No. 239,174
Int. Cl.³ B63C 3/06
U.S. Cl. 405—3 16 Claims



1. A boat hoisting construction installed at the water's edge comprising

post means positioned solely at the landward side of a boat both when water-borne in position to be hoisted and when hoisted vertically upwardly to a storage position,

said post means consisting of at least one vertically elongated stationary post capable of sustaining the weight and torque of a boat to be hoisted,

hoist means comprising a tubular hoist for each of said posts open at its bottom and mounted over its corresponding post to receive said post and movable vertically thereon,

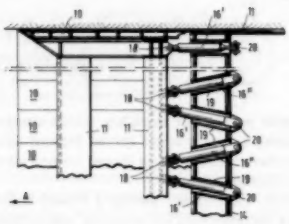
cradle means comprising boat cradle structure fixed to said hoist means to extend laterally therefrom in cantilever fashion to be movable therewith from a position below the bottom of a water-borne boat to be hoisted to receive a boat to an elevated position in which a boat supported thereon is raised above water level,

and power lift means acting between said post means and hoist means to raise and lower said cradle means.

4,432,665
TUNNEL DRIVING APPARATUS

Dieter Stuckmann, Selm, and Herbert Heitkamp, Werne, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,474
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033480
Int. Cl.³ E21D 9/00
U.S. Cl. 405—143 8 Claims



1. In tunnel driving apparatus which includes an advanceable front drive shield composed of a series of elongate drive members mounted for movement on a common support frame and rams for effecting relative movement between the drive members and the support frame whereby to advance the drive shield and a rear abutment in the form of a follow-up ring structure; the improvement comprising a plurality of further hydraulic rams mounted between the rear abutment and the support frame of the drive shield, the further rams being arranged in first and second groups, the rams of the first group being inclined in relation to the longitudinal central axis of the apparatus in one direction and the rams of the second group being inclined in relation to the longitudinal central axis of the apparatus in a direction opposite to said one direction, the rams of either group being operable collectively in unison effectively to exert a torque on the drive shield in either a clockwise or anticlockwise direction.

4,432,666
PROCESS FOR THE STORAGE AND DUMPING OF WASTE MATERIALS

Rudolf Frey, Burgdorf, and Peer-Ingo Litschke, Burgwedel, both of Fed. Rep. of Germany, assignors to VFI, Verwertungsgesellschaft fur Industrieruckstande mbH, Dollbergen, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,565
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950462
Int. Cl.³ B09B 3/00
U.S. Cl. 405—129 22 Claims

1. A method of depositing and ultimately disposing of special waste containing constituents which under environmental conditions can be eluted and emitted, comprising the steps of

(a) mixing the special waste with setting water and with a binder selected from the group consisting of calcium hydroxide, gypsum hardening on addition of water, waste gypsum, cement and cement-like products,

(b) permitting the mixture obtained by step (a) to solidify and thereafter granulating said solidified mixture to obtain an aggregate,

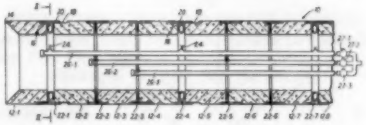
(c) repeating step (a) using said aggregate as the binder to form a new mixture, and

(d) depositing the mixture obtained by step (c) in a pourable state into holding means and causing it to finish-harden therein.

4,432,667
INSULATION OF TUNNEL LININGS

Michael A. Richardson, Hindhead, England, assignor to Marcon International Limited, Saint Peter Port, Channel Islands

Filed Jun. 10, 1980, Ser. No. 158,302
Claims priority, application United Kingdom, Jun. 16, 1979, 7921033; Aug. 22, 1979, 7929152; Sep. 1, 1979, 7930401
Int. Cl.³ E21D 9/00, 9/06, 11/00
U.S. Cl. 405—143 15 Claims



1. A method of non-disruptively installing a tunnel or shaft lining through a medium such as soil by longitudinally advancing an assembly of tunnel lining sections arranged in end to end relationship, which method comprises inflating with driving gas at relatively low pressure an inflatable torus formed of flexible material and capable of being inflated into the shape of a toroid located between a forward and a rearward section, the torus in the deflated state being in a generally flat condition, whilst restraining the outward expansion of the torus and preventing backward movement of the rearward section to cause the forward section to advance, the backward movement being prevented by the combined friction of the rearward section and the next rearward section with the surrounding medium which provides a reaction substantially equal to the rearward thrust exerted by the torus as it is inflated, and the sections in the assembly being grouped into equally-numbered groups of at least three, with the leading section of one group being axially spaced from the rearmost section of the preceding group and each member of each group being in thrust-transmitting engagement, and corresponding sections in each group being simultaneously advanced in sequence such that the section or sections being advanced always have at least double their number of sections in thrust-transmitting engagement behind them to prevent backwards movement, whereby the assembly is advanced perichaetially, the leading section being constituted by a tunnel shield of a diameter equal to the nominal diameter of the sections, so that there is essentially no over-cut in the medium, whereby settlement of the medium above the tunnel or shaft lining is avoided or at least significantly mitigated.

4,432,668
FOOT JOINT FOR CONNECTING A MOVABLE SERVICE TOWER OF AN OFF-SHORE STATION TO A FOUNDATION

Werner Rank, Oberhausen, Fed. Rep. of Germany, assignor to M.A. N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 13, 1982, Ser. No. 407,797
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132711
Int. Cl.³ E02B 17/00; E02D 27/04
U.S. Cl. 405—202 20 Claims

1. A foot joint for connecting a movable service tower of an offshore station to a structural part anchored to the sea bottom comprising:

a tension member connected between the tower and the structural part;

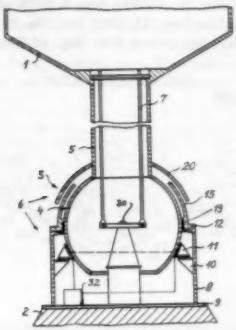
a spherical joint part connected to the lower end of the tower;

a shell casing connected to the structural part and defining a space for receiving at least a portion of said spherical joint part;

a plurality of bearings connected to said shell casing and slidably supporting said spherical joint part;

a cover ring connected to said shell casing and extending toward said spherical joint part;

a collar having a spherical section shape, connected to said cover ring and extending around a portion of said spherical



joint part and defining a gap with said spherical joint part; and

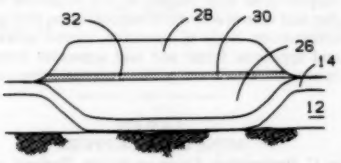
a stuffing seal box in said gap for sealing said gap and said shell casing space.

4,432,669

ICE ISLAND CONSTRUCTION

Gordon F. N. Cox, Lyme Center, N.H., and Kenneth G. Nolte, Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 11, 1981, Ser. No. 233,353
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—217 **4 Claims**



1. A method of constructing an artificial ice island in subfreezing temperature in a marine body having a natural ice sheet of sea water thereon which comprises:

constructing a lower level of fresh water ice by adding fresh water to a selected area of said ice sheet to form additional constructed ice until the bottom of the ice sheet in the selected area contacts bottom;

providing an insulation material to the top of said lower level of constructed fresh water ice

providing an impervious layer on either side of the insulation material;

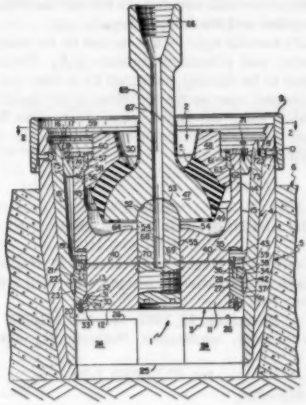
fabricating an upper construction layer of ice by adding sea water on top of said insulation and impervious layer, said impervious layer preventing brine from said upper construction layer from deteriorating said fresh water ice.

4,432,670

COMBINATION CONNECTOR AND FLEX JOINT FOR UNDERWATER TENSION ELEMENTS

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Oct. 1, 1980, Ser. No. 192,739
Int. Cl.³ E02D *5/74*; E02B *17/00*; F16L *27/04, 27/10*
U.S. Cl. 405—224 **17 Claims**



1. In a device for connecting a string of pipe to an underwater anchoring base by manipulation of the string of pipe from an operational base at the surface of the body of water, the combination of

a generally tubular female connector member adapted to be secured in upright position to the anchoring base and having

an internal transverse annular generally downwardly directed load-bearing shoulder,

a first annular inner surface portion located above the shoulder, and

a second annular inner surface portion located below the shoulder;

a male connector member dimensioned for downward insertion into the female connector member, the male connector member comprising

a body, and

an annular portion rigidly connected to the body and projecting upwardly therefrom, the longitudinal axis of the annular portion being coincident with the longitudinal axis of the male connector member;

expansible and contractible load-bearing shoulder means carried by the male connector member and constructed and arranged to coact with the load-bearing shoulder of the female connector member when the male connector member has been inserted downwardly to a predetermined position in the female connector member,

the expansible and contractible load-bearing shoulder means being generally annular and coxial with the upwardly projecting annular portion of the male connector member;

flex joint means comprising

a rigid ball member having

a stem adapted to be connected to the string of pipe, and a ball portion,

the ball member being disposed within the upwardly projecting annular portion of the male connector member with the ball portion spaced downwardlys from the upper end of the annular upwardly projecting portion and the stem projecting upwardly through the annular portion, and

a rigid socket member closely embraced by the upper end

portion of the upwardly projecting annular portion of the male connector member;

fastener means engaged between the socket member and the upwardly projecting annular portion of the male connector member to restrain the socket member against upward movement relative to the male connector member,

the flex joint means being constructed and arranged to transfer tension loads between the string of pipe and the male connector member via the ball member, the socket member and the fastener means; and

generally annular rigid means carried by the male connector member and presenting an outwardly directed annular surface to be slidably embraced by at least one of the first and second inner surface portions of the female connector member when the male connector member has been inserted to said predetermined position in the female connector member.

4,432,671

SUCTION ANCHOR AND METHOD OF INSTALLING A SUCTION ANCHOR

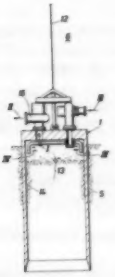
Simon Westra, The Hague, and Johannes R. Hogervorst, Rijswijk, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1981, Ser. No. 323,792

Claims priority, application Netherlands, Apr. 2, 1981, 8101640

Int. Cl.³ E02D 7/24

U.S. Cl. 405—226 10 Claims



4. A suction anchor having a closed top, side wall means forming an open interior chamber, and a downwardly directed open end at the bottom of said anchor adapted to be installed in the bottom of a body of water with an earth core extending upwardly into said interior chamber, comprising first pumping means carried by said anchor for reducing the pressure in the interior chamber of the anchor, second pumping means having discharge means operatively connected to said anchor for introducing water into the upper part of the said interior and for eroding the top of the earth core and forming and removing a mixture of bottom particles and water from the said interior chamber, said anchor furthermore including fluid inlet means connected to the discharge means of said second pumping means adjacent the top of said anchor in communication between the interior chamber and the space outside the anchor for introducing water under pressure into the upper part of the said interior chamber, fluid discharge conduit means fixedly mounted to the interior of said anchor in fluid communication with said fluid inlet means thereof, said conduit means having a discharge end terminating near the top of said interior chamber for discharging water under pressure into the upper part of the interior chamber against the earth core formed therein, and fluid outlet means adjacent the top of said anchor in communication between the interior chamber and the space outside the anchor for removing water or bottom particles and water from the said interior.

4,432,672

CANAL BUILDING APPARATUS

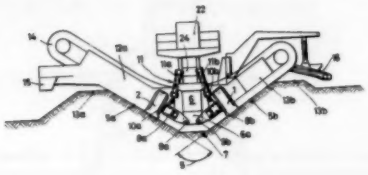
Egon U. Brüderle, Zweibrücken, and Willibald Wannemacher, Bierbach, both of Fed. Rep. of Germany, assignors to Mannesmann Demag AG, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 71,845, Sep. 4, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 323,713

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840800

Int. Cl.³ E02F 5/04

U.S. Cl. 405—268 4 Claims



1. An apparatus for the continuous longitudinal construction of a canal having a canal construction mode of operation and a transporting mode of operation capable of moving the apparatus from one working site to another, comprising:

(a) an apparatus frame;

(b) a pair of opposed wheel support arms pivotally attached to said apparatus frame;

(c) a wheel rotatably attached to each of said wheel support arms;

(d) said wheels, wheel support arms and apparatus frame being capable of achieving a configuration during the canal construction mode of operation, such that said wheels travel flush on the sloped walls of a canal and the center of gravity of said wheels, wheel supporting arms and apparatus frame lie below the berm of the canal;

(e) canal construction tool means transversely supported, in a cantilevered manner, on said apparatus frame;

(f) said canal construction tool means extending upwardly from said apparatus during the canal construction mode of operation and beyond said wheels; and

(g) adjustable maintaining means, attached between said apparatus frame and said wheel support arms for selectively determining the angular orientation of said wheel support arms with respect to said apparatus frame such that said wheels and wheel support arms, during the canal construction mode of operation, extend upwardly from said apparatus frame and said apparatus frame lies between said wheels and within the canal being constructed.

4,432,673

MINE ROOF SUPPORT

Adrian C. Buckmaster, Upton-on-Severn, England, assignor to Dowty Mining Equipment Limited, England

Filed Apr. 20, 1982, Ser. No. 370,091

Claims priority, application United Kingdom, Apr. 25, 1981, 8112825

Int. Cl.³ E21D 23/16

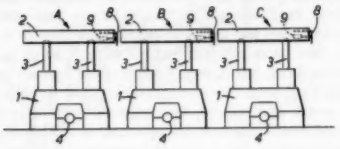
U.S. Cl. 405—302 7 Claims

1. A method of mining in which a mine roof is supported by a side by side assembly of mine roof supports, each having a lower part with a floor-engaging member, an upper part with a roof-engageable member, hydraulic prop means by which the height of the roof-engageable member can be adjusted with respect to the floor-engaging member, means associated with the lower part for advancing the mine roof support, and at least one hydraulically-operable abutment member associated with the roof-engageable member and energisable to move it away from the roof-engageable member, said method including the steps of

(a) advancing the mine roof supports, one after the other in

a predetermined sequence, from one roof-supporting position to another roof-supporting position, and

(b) simultaneously energising said hydraulically-operable abutment member located on one side of the upper part of an advancing mine roof support and said hydraulically-operable abutment member located on the other side of the upper part of that advancing mine roof support, if the advancing movement of the lower part of that mine roof support is being resisted, such that each side of the upper part of the advancing mine roof support is held in such



high frictional contact by said abutment members with the upper parts of the non-advancing mine roof supports located on opposite sides of the advancing mine roof support that advancing movement of the upper part is restricted and retarded with respect to the restricted advancing movement of the lower part; whereby, the advancing mine roof support effectively is caused to rotate about its upper part to raise the leading end of the lower part away from the part of the floor over which it is advancing and which is resisting advance of the lower part.

4,432,674

METHOD AND DEVICE FOR ANALYZING THE SOLID MATTER CONTENT IN A HYDRAULIC CONVEYING STREAM OF A CARRIER LIQUID WITH SOLID PARTICLES

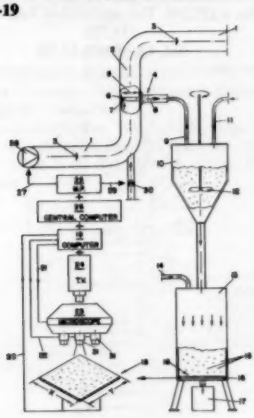
Reinhard Klose, and Günter Glienke, both of Salzgitter, Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 171,017, Jul. 18, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,410

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929430

Int. Cl.³ B65G 53/66

U.S. Cl. 406—19 **10 Claims**



1. A method of analyzing the solid matter content of a hydraulically conveyed stream in a conveyor pipeline to be monitored and controlled, which stream contains a carrier liquid and solid particles, comprising:

(a) taking a representative sample from the entire diameter of the conveyor pipeline;

(b) separating the sample particles from each other, while increasing the liquid proportion in the sample;

(c) depositing the thus separated sample on a filter surface;

(d) analyzing the solid particles as to shape and size; and

(e) adjusting at least one of the amount of the carrier liquid and a feed pressure in the pipeline according to the result of the analysis.

4,432,675

PNEUMATIC FEED CONTROL FOR PNEUMATIC SEEDER AND THE LIKE

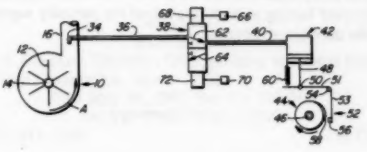
Cecil B. Machnee, Yorkton, Canada, assignor to Morris Rod-Weeder Co. Ltd., Yorkton, Canada

Filed May 3, 1982, Ser. No. 374,131

Claims priority, application Canada, Nov. 20, 1981, 390527

Int. Cl.³ B65G 53/66

U.S. Cl. 406—30 **14 Claims**



1. In an agricultural implement for dispensing particulate material and having: feed means for feeding predetermined amounts of said material to a delivery conduit, drive means for said feed means, a source of air under pressure, and air conduit means connecting said source with said delivery conduit to aid in the passage of fed material along said delivery conduit; the improvement comprising clutch means located between said drive means and said feed means, pneumatic actuator means operatively connected to said clutch means, pressure pick-up means located within said source, and pressure conduit means connecting said pick-up means with said actuator means, whereby pressure transmitted from said pick-up means to said actuator means permits said actuator means to maintain said clutch means in a position to connect said drive means with said feed means, but a negative pressure change at said source will cause said actuator means to operate said clutch means to disconnect said drive means from said feed means to thereby terminate the feeding of said material.

4,432,676

VEHICULAR MOBILE HIGH CAPACITY PNEUMATIC CONVEYOR

Wayne M. Jacobson, York, and Roger L. Quaintance, Henderson, both of Nebr., assignors to Cyclonaire Corporation, Henderson, Nebr.

Filed Jan. 15, 1982, Ser. No. 339,479

Int. Cl.³ B65G 53/40

U.S. Cl. 406—39 **8 Claims**

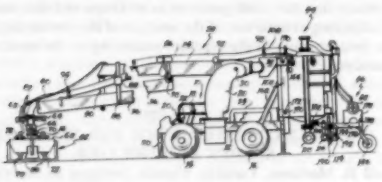
1. A mobile vehicular mounted pneumatic conveying apparatus, comprising:

a self-propelled vehicle having an elongated boom structure capable of being elevated and rotated relative to the vehicle;

a nozzle structure mounted to the outward end portion of said boom structure, said nozzle structure having a gimbal mounting to maintain a gimbal supported lower portion relatively level, said lower portion having at least one rotatable member for loosening the material to facilitate entry thereof into said nozzle structure;

a material transfer assembly including at least one closed vessel for receiving material under vacuum pressure and for subsequently expelling the material under positive pressure;

a conveying line interconnecting said nozzle structure and said transfer assembly;



said vehicle and said transfer assembly having a number of releasable connections to permit said transfer assembly to be removed from said vehicle;

said transfer assembly including a carriage structure having one end pivotally attached to said vessel, the opposite end thereof having at least one wheel for partially supporting the carriage structure.

4,432,677

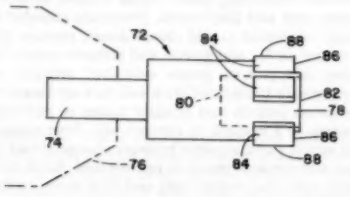
CUTTER FOR CYLINDRICAL LOCKS

Delmar D. Lewis, R.R. 2, Box 89, Letts, Iowa 52754

Filed Dec. 14, 1981, Ser. No. 330,619

Int. Cl.³ B23B *51/04*

U.S. Cl. 408—203.5 **1 Claim**



1. A rotary cutting tool for gaining access to the horizontal tumbler mechanism of a cylindrical lock having a central core surrounded by a ring provided with an annular interior surface of greater diameter than the exterior annular surface of the core so as to provide an annular gap receivable of a tubular key, said cutter comprising a one-piece cylindrical body having a rear end adapted to be chucked in a power tool and a coaxial tubular front end portion terminating in a smooth annular face radial to the axis of the body, said front end portion having an annular wall of such radial thickness as to fit into the gap of the lock and said annular wall having a continuous, smooth, interior annular surface for piloting of the tool on the lock core, said tubular portion having rigid with and exteriorly thereof a plurality of like cutter blades equi-angularly spaced apart and terminating in a radial plane offset axially rearwardly from the annular front face, each blade having a radial front cutting edge and an outer cutting edge extending rearwardly and lengthwise of the body for cutting out an annular portion of the lock ring to expose the tumbler mechanism.

4,432,678

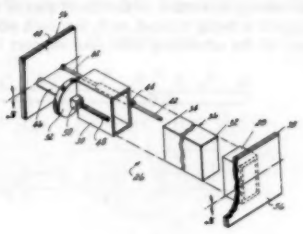
LOAD RETAINER

Henry L. Liebel, Cincinnati, Ohio, assignor to Angleboard Inc., Cincinnati, Ohio

Filed Nov. 6, 1981, Ser. No. 318,843

Int. Cl.³ B60P *7/08, 7/16*; B61D *45/00*

U.S. Cl. 410—151 **4 Claims**



1. A load retainer assembly for bracing a load in a load containing vehicle comprising:

a pair of shoes having side walls defining a pair of receptacles, each adapted to removably receive ends of a wooden bracing member,

a pair of end plates, one end plate being attached to one of said shoes, and

advancing and retracting means connected to the side walls of the other of said shoes outside of said receptacle and connecting the other of said shoes and the other of said end plates for adjusting the distance therebetween such that when the wooden bracing member is received in said shoes the overall distance between the said end plates may be adjusted to hold said end plates against the opposed walls of said vehicles with said bracing member extending therebetween and across said load to retain said load in said vehicle.

4,432,679

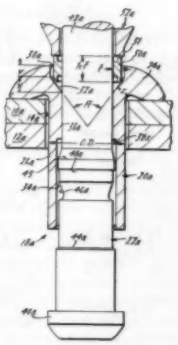
LOCK SPINDLE BLIND FASTENER FOR SINGLE ACTION APPLICATION

Donald J. Angelosanto, and James W. Kendall, both of Huntington Beach, Calif., assignors to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 954,111, Oct. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 835,363, Sep. 21, 1977, Pat. No. 4,127,345. This application Aug. 6, 1980, Ser. No. 175,723

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—34 **10 Claims**



1. In a fastener system including a blind fastener and a single action tool for securing together a plurality of workpieces with

said blind fastener having a tubular sleeve, an elongated pin adapted to be located within the sleeve for the relative movement therewith, and a lock collar adapted to be moved into locking engagement between said sleeve and said pin and with the fastener adapted to be set by said single action tool, said tool having an anvil engaging said lock collar whereby the force for setting the fastener is applied substantially solely between said pin and said lock collar, the improvement comprising: said sleeve having a straight shank portion terminating in an enlarged head portion at one end and having an axially extending bore, said pin having an elongated shank section terminating in an enlarged head structure at one extremity and being adapted to be located within said axial bore with said head structure located at the opposite end of said shank portion of said sleeve and to engage said opposite end upon application of a relative axial force between said pin and said sleeve for forming a bulbed head at said opposite end, said sleeve having an enlarged straight counterbore located in said enlarged head which counterbore is connected to said axial bore via a straight, tapered entry resistance angle portion, said resistance angle portion defining an included angle of from around 65° to around 85°, said lock collar being generally annular and located around said shank section and adapted to be located within said counterbore and seated against said resistance angle portion, said lock collar having an outer shape such that it is in clearance relationship with the outer surface of said enlarged head surrounding said counterbore whereby the setting force for the entire setting cycle is applied from the anvil to said resistance angle portion through said lock collar, said pin having a lock pocket on said shank section which when located in confrontation with said resistance angle portion defines a lock cavity, said anvil having an annular, elongated nose portion engageable with said lock collar whereby all of the setting loads are applied between said pin and said lock collar; said counterbore confining said lock collar as it is deformed by the relative force applied to said lock collar between said nose portion and said resistance angle portion and guiding the movement of said lock collar as it is moved into said lock cavity by said nose portion, said nose portion being of a diameter less than that of said counterbore and being of sufficient length to move substantially axially within said counterbore without engagement of said anvil with said sleeve whereby packing of said lock cavity with said lock collar is facilitated, said pin having a breakneck groove located on said shank portion at a position proximate said enlarged head portion and adapted to fracture thereat after formation of said bulbed head and setting of said lock collar.

4,432,680

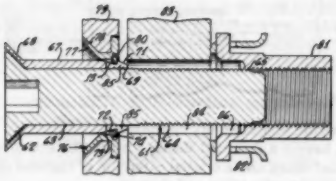
STRESSED PANEL FASTENER

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., El Segundo, Calif.

Continuation-in-part of Ser. No. 236,859, Feb. 23, 1981, abandoned. This application Jun. 29, 1981, Ser. No. 278,634

Int. Cl.³ E04B *1/48*; F16B *13/04, 37/04, 39/00*

U.S. Cl. 411—103 **27 Claims**



1. A fastener comprising

a member having

a head at one end, and

a shank projecting from said head,

said shank including a first portion of relatively large outside diameter adjacent said head,

and a second portion of relatively small diameter remote from said head, said second portion having a thread thereon,

a sleeve having an inside diameter greater than that of said second portion of said shank and less than that of said first portion of said shank,

said sleeve being received on said second portion of said shank and being axially movable relative thereto,

a collar circumscribing said shank,

said collar including means for attachment to a workpiece,

said collar having an inside diameter greater than that of the outside diameter of said sleeve and the outside diameter of said second portion of said shank, whereby said collar can move relative to said shank and to said sleeve so that either said second portion of said shank or said sleeve is received in said collar,

and retainer means for limiting said relative movement so that said collar cannot move off of said sleeve in the direction of the outer end of said shank, and cannot move off of said first portion of said shank in the direction of said head.

4,432,681

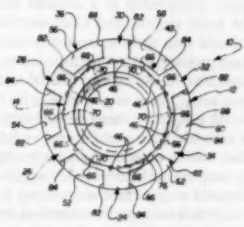
FASTENER

Terry D. Capuano, Hinckley, Ohio, assignor to Russell Burdsall & Ward Corporation, Mentor, Ohio

Filed May 28, 1981, Ser. No. 268,067

Int. Cl.³ F16B *37/04, 39/00*

U.S. Cl. 411—180 **10 Claims**



1. A fastener adapted to be received in a member and held against axial and rotational movement relative to the member by interaction between the member and said fastener, said fastener comprising a head section having a central axis, a shank section extending axially outwardly from seid head section and having a central axis coincident with the central axis of said head section, said head section having a rim portion which extends radially outwardly from and faces axially outwardly along said shank section, a thread convolution connected with and disposed in a coaxial relationship with said head and shank sections, an annular groove formed in the rim portion of said head section and circumscribing said shank section, a plurality of flat arcuate stop surfaces areas disposed in a spaced apart relationship in a circular array on the rim portion of said head section and circumscribing said shank section, each of said stop surface areas extending radially outwardly from said groove and being disposed in a plane which extends perpendicular to the central axis of said head section, said stop surface areas being engageable with the member to limit the extent of axial movement of said fastener as it is inserted into the member, a plurality of wedge shaped compression ramps disposed on said rim portion of said head section in a circular array circumscribing said shank section and extending radially outwardly from said groove, each of said wedge shaped compression ramps being disposed between and projecting axially outwardly of a pair of said stop surface areas and having a face surface which slopes radially and axially inwardly toward said shank section from a radially outer end portion disposed axially outwardly of the plane containing said

stop surface areas, a plurality of side surface areas disposed on said shank section in a circular array having a central axis coincident with the central axis of said shank section, each of said side surface areas extending axially outwardly from said groove to an axially outer end portion of said shank section, said compression ramps being effective to force the material of the member into the groove and around the side surface areas on said shank section as the fastener is inserted into the member to thereby hold said fastener against axial and rotational movement relative to the member, said side surface areas on said shank section intersect at corner portions which extend axially along said shank section, said groove extending radially inwardly of said corner portions to enable the material of the member to be forced into portions of said groove at locations radially inwardly of said corner portions to hold said fastener against axial movement, said groove having a radially inner side surface which extends tangentially to a central portion of each of said surface areas on said shank section.

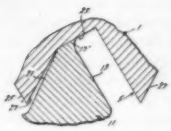
10. A fastener adapted to be received in a member and held against axial and rotational movement relative to the member by interaction between the member and said fastener, said fastener comprising a head section having a central axis, a shank section extending axially outwardly from said head section and having a central axis coincident with the central axis of said head section, said head section having a rim portion which extends radially outwardly from and faces axially outwardly along said shank section, a thread convolution connected with and disposed in a coaxial relationship with said head and shank sections, an annular groove formed in the rim portion of said head section and circumscribing said shank section, a plurality of flat arcuate stop surfaces areas disposed in a spaced apart relationship in a circular array on the rim portion of said head section and circumscribing said shank section, each of said stop surface areas extending radially outwardly from said groove and being disposed in a plane which extends perpendicular to the central axis of said head section, said stop surface areas being engageable with the member to limit the extent of axial movement of said fastener as it is inserted into the member, said annular groove having a radially outer side surface which extends at an acute angle to the plane containing the stop surface areas and which intersects the plane containing said stop surface areas along a circular line of intersection which defines radially innermost ends of said stop surface areas, a plurality of wedge shaped compression ramps disposed on said rim portion of said head section in a circular array circumscribing said shank section and extending radially outwardly from said groove, each of said wedge shaped compression ramps being disposed between and projecting axially outwardly of a pair of said stop surface areas and having a face surface which slopes radially and axially inwardly toward said shank section from a radially outer end portion disposed axially outwardly of the plane containing said stop surface areas, said face surfaces on said compression ramps being formed as continuations of said radially outer side surface of said groove and extending at the same acute angle relative to the plane containing said stop surface areas as said side surface of said annular groove, said face surfaces on said compression ramps intersecting said radially outer surface of said groove at the circular line of intersection of said stop surface areas with said radially outer side surface of said groove, a plurality of side surface areas disposed on said shank section in a circular array having a central axis coincident with the central axis of said shank section, each of said side surface areas extending axially outwardly from said groove to an axially outer end portion of said shank section, said side surface areas on said shank section intersecting at corner portions which extend axially along said shank section, said compression ramps being effective to force the material of the member into the groove and around the side surface areas on said shank section as the fastener is inserted into the member to thereby hold said fastener against axial and rotational movement relative to the member, said groove extending radially inwardly of said corner portions to enable the material of the member to be forced into portions of said groove at locations radially inwardly of said corner portions to hold said fastener against axial movement.

4,432,682

THREADED FASTENER ASSEMBLY

Arthur J. McKewan, Rochester, Mich., assignor to Microdot Inc., Greenwich, Conn.

Filed Dec. 4, 1978, Ser. No. 966,279
Int. Cl.³ F16B *39/30*
U.S. Cl. 411—311 **4 Claims**



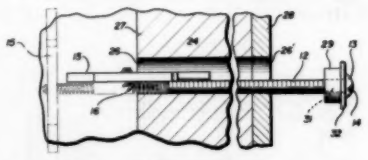
1. A threaded fastener assembly comprising a body having an internal aperture provided with internal modified V-shaped helical threads and a bolt having a shank provided with complementary external modified V-shaped helical threads to mate with said internal helical threads, said internal threads having an internal thread configuration comprising a leading flank and a following flank and a wedge ramp root section extending between the leading and following flanks, said leading flank and following flank being symmetrical and making an angle A with an imaginary plane normal to the axis of the threads, said external threads having an external thread configuration comprising a leading flank and a following flank and a crest between the leading and following flanks, the leading and following flanks of said external thread configuration being asymmetrical and said external thread leading flank making said angle A with said plane and said external thread following flank making an angle that is less than A with said plane whereby clearance is provided between the internal and external following flanks and contact is between said crest and said wedge ramp, said internal and external threads being sized and proportioned so that substantially all load is transferred by contact between said crest and said ramp and there is substantially no bending load on the flank of the internal thread.

4,432,683

TOGGLE BOLT ASSEMBLY

Constantine D. Polos, 524 Williamsburgh, Glen Ellyn, Ill. 60137

Continuation of Ser. No. 144,529, Apr. 28, 1980, abandoned which is a continuation-in-part of Ser. No. 928,107, Jul. 26, 1978, abandoned.
This application Jun. 23, 1982, Ser. No. 391,121
Int. Cl.³ F16B *35/04*
U.S. Cl. 411—340 **6 Claims**



1. A toggle bolt assembly comprising:

a bolt having a threaded shank, a head attached to one end of said shank and a coaxial extension of reduced diameter attached to the other end thereof,

an elongated resilient helical coil spring frictionally engaging said extension and projecting coaxially therefrom, the outer diameter of said spring being substantially equal to the diameter of said shank;

the coils of said spring having a pitch substantially equal to that of the threads on said shank and the same direction of rotation, said spring and said shank being rotationally mismatched so that the coils of said spring do not form a continuation of the helix defined by said threads;

cooperating means on said spring and said extension for preventing relative rotation thereof in one direction;

a generally flat elongated toggle head having a threaded opening intermediate its ends adapted to threadedly engage said shank and said coil spring;

said spring being resiliently bendable sufficiently to permit said head to achieve a position adjacent and generally parallel to said shank when said head is positioned on said spring.

4,432,684

THREADED MEMBERS

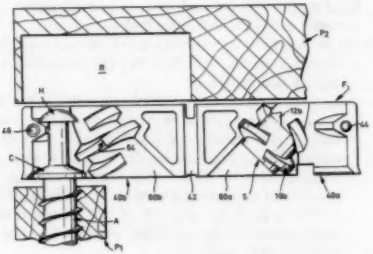
John P. Palmer, Basingstoke, and Neil P. Blackburn, Winchester, both of England, assignors to ITW Limited, Windsor, England

Filed Jul. 23, 1981, Ser. No. 286,120

Claims priority, application United Kingdom, Jul. 25, 1980, 8024464

Int. Cl.³ F16B *27/00*

U.S. Cl. 411—366 **9 Claims**



1. A threaded member comprising an elongate shank defining a longitudinal axis, the shank having a first external helical thread including a leading end, a trailing end and a crest, and the radial separation of the crest from the longitudinal axis of the shank being less at the leading end of the first thread than at the trailing end of the first thread, with the trailing end of the first thread being in the form of an abutment, and an additional thread on said shank which overlaps said first thread substantially all of their lengths, said additional thread including a leading end, a trailing end and a crest, with the radial separation of the crest of the additional thread from the longitudinal axis of the shank remaining constant from the leading end of the additional thread to the trailing end of the additional thread.

4,432,685

APPARATUS FOR FORMING STACKS FROM CONTINUOUSLY ARRIVING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, PARTICULARLY THOSE ARRIVING IN A LAPPED OR IMBRICATED STREAM

Hans-Ulrich Stauber, Grüt, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jul. 27, 1981, Ser. No. 287,480

Claims priority, application Switzerland, Aug. 15, 1980, 6160/80

Int. Cl.³ B65G *57/30*

U.S. Cl. 414—31 **18 Claims**

1. An apparatus for forming stacks from continuously arriving, substantially flat products, especially printed products, in particular products arriving in an imbricated product stream, comprising:

a prestacker device for forming partial stacks;

a stacker device having a stacker chute;

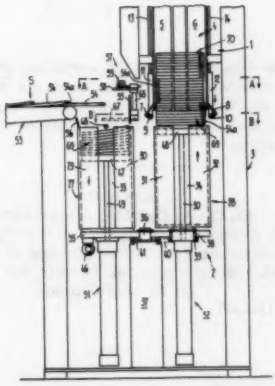
support means arranged below said stacker chute of said stacker device;

said stacker device serving for stacking the partial stack reposing upon the support means within the stacker chute of said stacker device into a final stack;

a retention device movable relative to said support means;

said retention device being placeable into an operative position following relative movement of the partial stack which is to be processed past said retention device where said retention device engages below said partial stack;

said prestacker device comprising two out-of-phase operating prestacker units movable between a receiving position and a delivery position located below the stacker device;



a stacker chute provided for each prestacker unit;

a respective support table provided for each prestacker unit for closing towards the bottom the related stacker chute thereof and defining said support means;

means for elevationally displacing said retention device relative to the support table of the prestacker unit located in the delivery position in order to receive the partial stack;

means for raising and lowering the support tables of said prestacker units; and

said retention device can be raised and lowered and in a lower terminal position of the partial stack reposing upon a related support table located in its upper end position engages below such partial stack.

4,432,686

APPARATUS FOR PLACING PACKETS OF TUBE SECTIONS IN THE STACKING MAGAZINE OF A ROTARY APPLICATOR

Richard Feldkämper, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,526

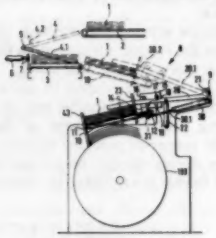
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046280

Int. Cl.³ B65H *57/06, 29/36*

U.S. Cl. 414—77 **17 Claims**

1. Apparatus for placing packets of tube sections in the stacking magazine of a rotary applicator equipped with suction rollers, characterised in that, between the stacking magazine and the conveyor means supplying the tube section packets, there is a pivotably mounted arm on which a supporting frame is longitudinally displaceable, the frame being provided at the ends with direction-changing rollers over which endless belts

run and being pivotable by a pivot drive between its upper, obliquely rising position in which it receives the tube section packets and its lowered position in which it discharges them again, and that the arm is provided with an abutment securing



the tube section packets on the supporting frame and with braking means which engage the upper run of the belts between the abutment and the rear direction-changing roller and which comprise means for releasing same to receive the tube section packets.

4,432,687

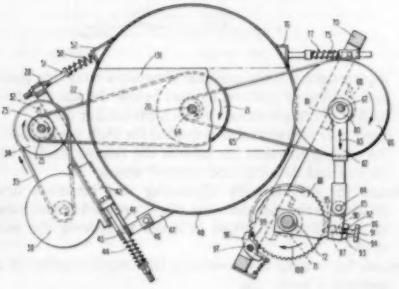
SILO UNLOADING APPARATUS

Richard L. Weaver, R.D. 4, Myerstown, Pa. 17067

Continuation-in-part of Ser. No. 191,071, Sep. 26, 1980, Pat. No. 4,377,364. This application Sep. 14, 1981, Ser. No. 302,191

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—307 **17 Claims**



1. In a silo unloader of the bottom unloader type having an unloading auger generally radially disposed at the bottom of the silo and mounted for rotation on its own axis for intermittent arcuate sweeping movement across the floor of the silo, including an auger mount substantially at the center of the silo at about the floor level, said mount being rotationally moveable about a generally vertical axis and having a ring-like portion disposed in the silo floor and moveable therewith, including intermittent drive means for engaging said ring-like portion and driving it in a series of repeated intermittent arcuate motions, for driving the auger in a uniform intermittent sweeping motion across the silo floor, whereby silage may be delivered through a generally centrally located discharge opening in the silo floor, wherein a drive shaft is provided inside said silo, and motor means is provided for driving said drive shaft in a continuous rotational motion with means operatively connecting said drive shaft and said auger for rotationally driving the auger on its own axis in a continuous rotational motion from said drive shaft, and wherein conversion means is provided in said silo at the general center thereof as part of said intermittent drive means, operatively connected to said drive shaft for converting continuous rotational motion from said drive shaft to an intermittent motion provided to said intermittent drive means.

4,432,688

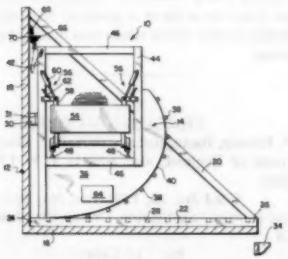
TIPPLE

Christian E. Schmidt, Rte. 5, Box 650, Easton, Md. 21601

Filed Aug. 27, 1981, Ser. No. 296,847

Int. Cl.³ B65G *67/48*

U.S. Cl. 414—358 **12 Claims**



1. A tipple, comprising:

a fixed support having two horizontal and parallel rails with inboard and outboard ends; and

a cradle assembly movably mounted on said rails, including

two rocker members, each with a curved surface engaging one of said rails, and

means for supporting a vehicle on said rocker members with a combined center of gravity of the vehicle and said cradle assembly located relative to said curved surfaces such that said cradle assembly with a loaded vehicle thereon freely rolls from a normal, vertical position at said inboard ends through an angle of about 135° to a dumping position at said outboard ends, and then automatically and freely rolls back to the vertical position after unloading,

each said curved surface having a curvature in which radial distances from said combined center of gravity to each of said curved surfaces and radii of curvature of each said curved surface decrease along said curvature from an inboard end to an outboard end thereof.

4,432,689

APPARATUS AND METHOD FOR HANDLING CARGO USING FLEXIBLE SUPPORT STRAPS

Melvin E. Shell, Box 1121, Stephenville, Tex. 76401

Filed Sep. 28, 1981, Ser. No. 306,315

Int. Cl.³ B66C *1/18*

U.S. Cl. 414—416 **12 Claims**

10. A cargo handling system for loading and unloading a cargo load comprising one or more discrete cargo units with respect to a conveyance for said load, said system comprising:

a plurality of flexible cargo straps;

a cargo suspension frame adapted to mount on top of said load, said suspension frame including a generally rectangular frame member, a plurality of strap winding and unwinding reels mounted along at least one side of said frame member, power means on said frame member and drivably connected to said reels for rotating said reels, means on each of said reels cooperable with means on one end of each of said straps to be wound on said reels, respectively, for releasably connecting said straps to said reels, respectively, releasable strap locking means mounted along a side of said frame member opposite said reels, said locking means being operable to receive and retain said straps when said reels are rotated to tighten said straps around said load, said locking means for each of said straps comprising cam means for securing said

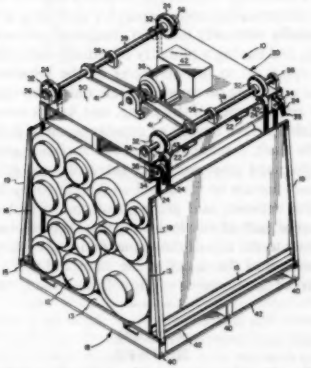
straps, respectively, by a wedging action between said cam means and a surface on said suspension frame, and said locking means comprises linkage connected to said cam means and operable, at will, to actuate said cam means to release said straps; and

means on said suspension frame for engaging said suspension frame by cargo transport means to move said load.

12. A method for moving cargo from one point to another, said cargo comprising unitized loads made up of one or more cargo units, said method comprising the steps of:

providing a plurality of elongated flexible straps;

providing a suspension frame comprising a frame member having a plurality of strap winding reels disposed along at least one side thereof, said straps and said reels being provided with means for releasably connecting said straps to said reels at one end of said straps, respectively, and locking means for engaging and releasably locking said straps to said suspension frame disposed along an opposite side of said frame member;



placing said suspension frame generally directly above said load;

placing said straps under said load with opposite ends of said straps being trained generally vertically upward along opposite sides of said load;

connecting each of said straps at one end to said reels, respectively, and engaging said straps with said locking means adjacent the opposite ends of said straps, respectively;

winding said straps on respective ones of said reels to tighten said straps under said load;

lifting said suspension frame and said load and moving said load to a destination;

placing said load on a support surface at said destination;

actuation said locking means to release one end of each of said straps;

disengaging the other end of each of said straps from said reels, respectively; and

removing said suspension frame from said load while leaving said straps under said load.

4,432,690

STRADDLE CARRIER

John T. Monk, 405 Meadow Moss Dr., Jackson, Miss. 39206

Continuation of Ser. No. 912,991, Jun. 6, 1978, abandoned. This application Nov. 3, 1980, Ser. No. 203,328

Int. Cl.³ B60P *3/00*

U.S. Cl. 414—460 **29 Claims**

1. A straddle carrier, either end of which may be driven over a load to be lifted, said straddle carrier comprising:

a chassis including spaced parallel elongated frame members connected together adjacent their respective ends by vertically disposed structural arches to form a rigid rectangular frame enclosing an unobstructed load bay;

at least two pairs of wheels disposed on each side of said chassis;

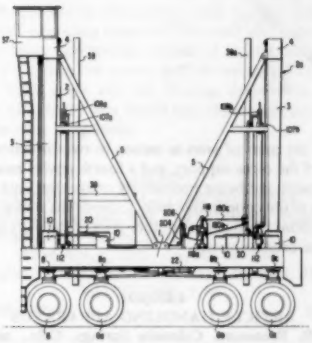
air over oil suspension means for attaching each said wheel to said chassis;

rectangular load lifting means disposed between said frame members;

means for attaching said load lifting means to a load;

means for raising and lowering the load lifting means including hydraulic cylinders connected at their lower ends to said frame members and disposed adjacent the corners of said rectangular load lifting means;

upwardly movable rams respectively disposed in said cylinders;



pulleys respectively mounted on the rams;

cables respectively connected to said four corners of said load lifting means and extending over said pulleys with their other ends connected to said chassis and a hydraulic circuit for simultaneously actuating said rams to raise or lower said load lifting means; and

means for controlling the raising and lowering means for the load lifting means including means for sensing uneven extensions of the rams including further cables each having one end connected to a ram, one of said further cables being directly connected to a weight and the remaining further cables being connected through said sensing means to said weight, said sensing means being responsive to the tensions of said remaining further cables to equalize the extensions of said rams.

4,432,691

PIPE MANIPULATOR

Russell L. Sterner, Greencastle, Pa., assignor to Kiddie, Inc., Saddle Brook, N.J.

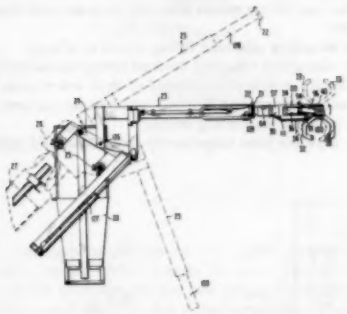
Filed Oct. 16, 1981, Ser. No. 312,081

Int. Cl.³ B66C *1/42*

U.S. Cl. 414—735 **20 Claims**

1. A manipulator for pipes and the like comprising a longitudinal body portion adapted for attachment to a support, a cross support pivotally mounted on the body portion and adapted to swing in two directions relative thereto, pairs of cooperative pipe gripping jaws on the cross support and being bodily swingable therewith on the pivot axis of the cross support and also being rotationally connected to the cross support whereby the pairs of jaws can move rotationally in unison around the axis of the cross support, one jaw of each cooperative pair being fixed relative to the other jaw of each pair and the other jaw of each pair being movable relative to the fixed jaw around the axis of the cross support, said longitudinal body portion including a rotational assembly bodily carrying the cross support and pivot means for the cross support defining said pivot axis, a first power means on said body portion operable to

rotate said rotational assembly in two directions, a second power means connected between the body portion and cross support and operable to swing the latter in two directions on its pivot axis, a third power means connected between the body portion and said cross support and pairs of jaws and operable



to rotate the pairs of jaws in unison in two directions around the axis of the cross support, and a fourth power means on the cross support and being operatively connected with the movable jaws of the cooperative pairs to move the movable jaws in two directions relative to the other jaws of the pairs around the axis of the cross support.

4,432,692

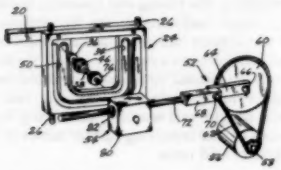
ARTICLE HANDLING APPARATUS

Warren R. Breneman, Colorado Springs, Colo., assignor to Woodford Manufacturing Company, Colorado Springs, Colo.

Filed Oct. 28, 1981, Ser. No. 315,758

Int. Cl.³ B65G *25/00*

U.S. Cl. 414—749 **11 Claims**



1. An article handling apparatus comprising,

a base frame,

a guide member,

means for supporting said guide member on the base frame with freedom of at least limited two-dimensional movements,

an article support means mounted on said guide member for movement therewith,

said guide member including an elongated cam slot,

a drive shaft having a cam follower supported thereon,

means for rotatably supporting said drive shaft on said base frame at a position such that said cam follower is positioned within said cam slot,

coacting drive means on said guide member and drive shaft operative, in response to rotation of said drive shaft, to produce translation of said guide member and article support means along a path defined by said cam slot, and

said coacting drive means comprising a pinion gear fixed on said drive shaft and a coacting elongated gear rack connected to said guide block and having a contour and position for operative engagement with said pinion gear at all positions of said guide member.

4,432,693

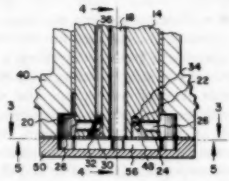
CENTRIFUGAL PUMP IMPELLER

Reuben J. Hackbart, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Feb. 18, 1982, Ser. No. 349,799

Int. Cl.³ F04D *1/12*; F01M *1/02*

U.S. Cl. 415—88 **19 Claims**



14. In a two-stage centrifugal oil pump impeller of the type found in reciprocating compressors for operating at the end of a substantially vertically oriented crankshaft submerged in oil in a sump, and having a plurality of radially extending tunnels for conveying oil to the perimeter of the impeller; an inlet means for providing oil to said tunnels and improving the head and flow performance of the pump, said means comprising an annular inlet groove having an annular opening in the bottom end of the shaft; a subtending groove surface narrower than said opening; and inner and outer sidewalls; said groove intersecting said tunnels to form loci each defined by the area of intersection between said groove and one of said tunnels, at least a part of each of said loci being disposed at an acute angle with respect to the axis of the tunnel defining it, thereby opening the bottom of the tunnel at the inner end and exposing at least a part of the tunnel to oil flow from directly therebelow.

4,432,694

BLOWER

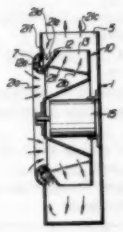
Sigeaki Kuroda; Akira Arai, both of Shimizu; Takao Senshu, Shizuoka; Shinjiro Ueda, Abiko; Masamichi Hanada, and Mineo Takahashi, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,711

Claims priority, application Japan, Feb. 25, 1980, 55-21671

Int. Cl.³ F04D *29/16*

U.S. Cl. 415—170 A **3 Claims**



2. A centrifugal blower comprising:

a casing including two end plates located in spaced juxtaposed relation and enclosed at an outer periphery by a side plate formed with a discharge port, one of said end plates being formed at a central portion thereof with a suction port having a suction member; and

an impeller having a shroud mounted in said casing;

wherein said suction member has a semicircular shape and the shroud of the impeller includes an inclined wall portion terminating in a semicircular wall means disposed in

spaced juxtaposition with at least a portion of the semicircular shaped suction member for creating a countercurrent so as to inhibit an air leak flow into a semicircular clearance between the semicircular suction member and the curled wall means of the shroud.,

---

4,432,695

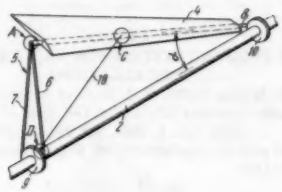
WIND MOTOR

Bogdan V. Voitsekhovsky, and Mikhail B. Voitsekhovsky, both of Novosibirsk, U.S.S.R., assignors to Institut Gidrodinamiki Imeni M.A. Lavrentieva, Novosibirsk, U.S.S.R.

Filed Oct. 29, 1981, Ser. No. 316,494

Int. Cl.³ F03D *1/06*

U.S. Cl. 416—17 **6 Claims**



1. A wind motor assembly comprising:

a support structure;

a shaft mounted on said support structure for rotating relative to its longitudinal axis;

a rotor arranged on said shaft;

said rotor having blades extending longitudinally of said shaft at an angle thereto, girders in the form of triangular pyramids serving for connecting said blades with said shaft, each of said girders having a first rod extending from an apex of each of said pyramids longitudinally of said shaft at an angle to the longitudinal axis thereof, said first rod passing through said corresponding blade longitudinally thereof connected therewith and with the end of said shaft at the outlet of the windstream, two more rods extending from said apex of said triangular pyramid, a hub secured on the opposite end of said shaft at the side of the rotor facing the windstream, said two rods being secured on said hub tangentially thereto.

4,432,696

ROTOR STRUCTURE FOR A ROTARY WING AIRCRAFT

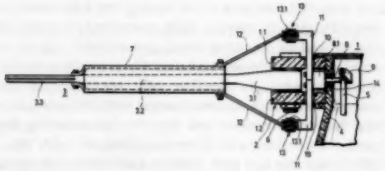
Michael Stephan; Karlheinz Mautz, both of Ottobrunn, and Alois Schwarz, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,378

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036093

Int. Cl.³ B64C *27/35*

U.S. Cl. 416—134 A **5 Claims**



1. A rotor structure for adjusting blade angle movements about a respective radial blade angle axis in a rotary wing aircraft, comprising hollow rotor hub means (4) having a rotational axis, wing means each including a blade and a torsion yielding blade neck (3.2), hingeless and bearingless means (2) for securing said torsion yielding blade neck to said rotor hub means, and blade angle adjustment means comprising control shaft means (8) and shaft operating means (5, 9), said shaft means (8) and said shaft operating means (5, 9) being operatively housed inside said hollow rotor hub means, bearing means (14) secured to said hollow rotor hub means operatively supporting said control shaft means (8) inside said hollow rotor hub means (4) to extend radially out of said hollow rotor hub means (4) in radial, axial alignment with the respective blade angle axis, torsion-stiff sleeve means (7) rigidly connected to the respective blade so that said torsion yielding blade neck (3.2) extends radially and axially through said torsion-stiff sleeve means, yoke means (11, 12) arranged for bridging said torsion yielding blade neck substantially in the direction of said radial blade angle axis, said yoke means operatively connecting said torsion-stiff sleeve means (7) to said control shaft means (8), said shaft operating means (5, 9) inside said hollow rotor hub means being operatively connected to said control shaft means (8) for tilting the torsion-stiff sleeve means (7) around the radial blade angle axis for twisting the torsion yielding blade neck (3.2) to thereby adjust said blade angle movements of the respective wing blade.

4,432,697

ROTOR OF AXIAL-FLOW MACHINE

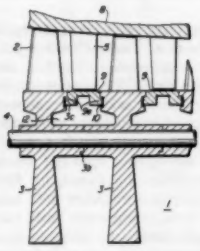
Haruo Miura, and Yoshiaki Abe, both of Ibaraki, Japan, assignors to Hitach, Ltd., Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,597

Claims priority, application Japan, Apr. 10, 1981, 56/53182

Int. Cl.³ F01D *5/06*

U.S. Cl. 416—198 A **10 Claims**



10. A rotor of an axial-flow machine comprising a plurality of rotor blades arranged in a stator blade lattice and supported on disc sections in a manner to be mounted and removed as desired, said rotor comprising a stacked-rotor including a plurality of discs stacked one over another and interconnected by stacking-bolts, said rotor further comprising:

a plurality of circumferential grooves located peripherally of the rotor on opposite outer peripheral surfaces of the adjacent disc sections in spaced juxtaposed relation;

spacer means including a plurality of spacer members located peripherally of said circumferential grooves and outer surfaces each forming a channel on the surface of the rotor juxtaposed against the end of each stator blade;

projecting portions each divided into a plurality of elements peripherally of each said circumferential groove to be successively fitted therein to keep said spacer means from being dislodged outwardly of the rotor by engaging the outer peripheral shoulder of each said circumferential groove;

cutout means formed at least in one portion of each said circumferential groove and having a length slightly greater than the peripheral length of each said spacer member to allow the spacer members to be successively

inserted therethrough into the circumferential grooves; and

means for avoiding dislodging of a last spacer member inserted in the circumferential grooves through said cutout means, said last spacer member dislodging avoiding means being located both in the last spacer member and the disc section.

4,432,698

COMPRESSOR HAVING A STARTING LOAD REDUCING APPARATUS

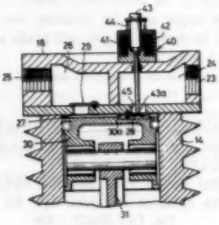
Takashi Shirakuma; Fujio Nakamichi, and Osamu Iguchi, all of Yokohama, Japan, assignors to Tokico, Ltd., Kawasaki, Japan

Filed Nov. 3, 1981, Ser. No. 317,871

Claims priority, application Japan, Nov. 4, 1980, 55-157775[U]

Int. Cl.³ F04B *49/06*

U.S. Cl. 417—27 **5 Claims**



1. A compressor having a starting load reducing apparatus comprising:

a main compressor body for compressing gas obtained under suction from an intake chamber through an intake valve within a compression chamber, and ejecting the compressed gas through an outlet opening;

a motor for driving said main compressor body;

first and second switches for starting said motor when both said first and second switches are closed;

a solenoid mechanism operated when both said first and second switches are closed, for forcibly communicating said compression chamber with said intake chamber, to put said main compressor body into a non-compressing operational state;

a rectifier provided at a stage before a coil of said solenoid mechanism; and

a positive thermally sensitive resistor element provided at a stage before said rectifier,

said solenoid mechanism operating after both said first and second switches are closed until a time when the resistance of said positive thermally sensitive resistor element reaches a predetermined resistance.

4,432,699

PERISTALTIC PIEZOELECTRIC PUMP WITH INTERNAL LOAD SENSOR

John B. Beckman, Cedartown, and Martin J. Blickstein, Austell, both of Ga., assignors to The Abet Group, Rome, Ga.

Continuation-in-part of Ser. No. 374,890, May 4, 1982. This application Jan. 3, 1983, Ser. No. 451,231

Int. Cl.³ F04B *17/04, 43/04, 43/12*

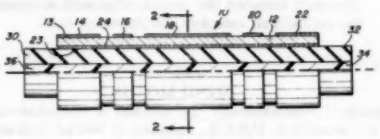
U.S. Cl. 417—63 **18 Claims**

1. A piezoelectric pump comprising:

a plurality of piezoelectric tube regions, each said region having an outer surface and an inner surface defining a cavity;

an electrode associated with each said outer surface and inner surface for applying electric signals to said surfaces;

means for selectively phasing said electrical signals such that said regions expand and contract in a peristaltic motion to pump fluid through said cavity; and



means for sensing the piezoelectric effect that results from the internal load on the innermost of said piezoelectric tube regions.

4,432,700

MILK PUMPING SYSTEM FOR VACUUM MILKING INSTALLATIONS

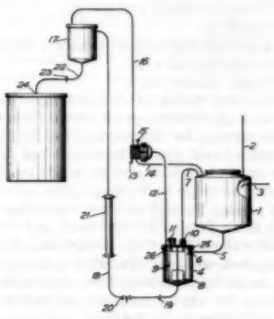
Friedrich Icking, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,478

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111233

Int. Cl.³ F04F *1/12*

U.S. Cl. 417—121 **5 Claims**



1. In a milk pumping apparatus for a vacuum milking installation for withdrawing milk from a milk receiver under constant vacuum to atmospheric pressure, having a first milk releaser including a liquid input connected to the milk receiver by a milk outlet line with a clack valve, a milk outlet, a first valve for opening and closing a vacuum line between the milk receiver and the first milk releaser, a second valve for opening and closing a vent to the atmosphere and a float for opening the first valve and closing the second valve when there is less than a preselected amount of milk in the first milk releaser and for closing the first valve and opening the second valve when there is more than a preselected amount of milk in the first milk releaser the improvement comprising:

an air actuated two-way valve having one inlet connected to the atmosphere, another inlet connected to a vacuum, an outlet, and an actuating input connected by an air line to the first milk releaser and directly responsive to the prevailing pressure in the first milk releaser such that the valve's outlet is in communication with the one inlet when the first milk releaser and thereby the actuating input is under a vacuum and in communication with the other inlet when the first milk releaser and thereby the actuating input is at atmospheric pressure; a second milk releaser having a fluid inlet connected to the outlet of the two-way valve and a milk inlet; and means connecting the milk inlet of the second milk releaser to the milk outlet of the first milk releaser whereby milk collected in the first releaser is

aspirated by the second milk releaser while a vacuum is maintained in the second milk releaser.

4,432,701

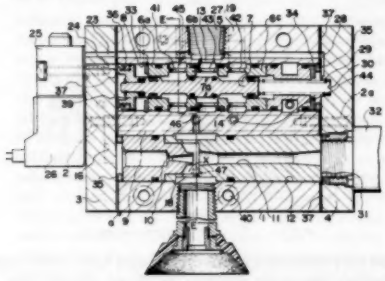
VACUUM CONTROLLING DEVICE

Yoji Ise, c/o Kabushiki Kaisha Myotoku Seisakusho, 6-18,Shimomaruko 2-Chome, Ota-Ku, Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,747

Int. Cl.³ F04F *5/48*

U.S. Cl. 417—187 **2 Claims**



2. The device according to claim 1, including a vacuum confirming device, comprising a piston movable in a cylinder, said cylinder being in communication with said aspirator chamber, said piston being movable on establishment of a vacuum in said aspirator chamber to activate a microswitch.

4,432,702

SWASH PLATE TYPE COMPRESSOR

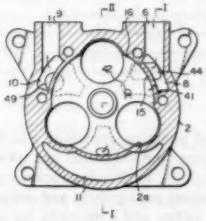
Yatsuhiro Honzawa, Kariya; Masuyoshi Moriyama, and Hidekazu Iwamori, both of Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Sep. 10, 1981, Ser. No. 300,922

Claims priority, application Japan, Sep. 17, 1980, 55-133004[U]

Int. Cl.³ F04B *1/16, 1/18*

U.S. Cl. 417—269 **2 Claims**



1. A swash plate type compressor including: a pair of horizontal cylinder blocks jointed in axial alignment to form a horizontal combined cylinder block having therein a plurality of axial cylinder bores, said combined cylinder block further having a pair of suction ports formed adjacent to the joint of said pair of horizontal cylinder blocks for introducing a refrigerant gas into the combined cylinder block; front and rear housing attached to the front and rear ends of said combined cylinder block, via valve plates, respectively, each said housing having therein a suction chamber and a discharge chamber; a driving shaft extending axially through the center of said horizontal combined cylinder block, said driving shaft being rotatably supported in said combined cylinder block; a swash plate fixedly mounted on said driving shaft and received in a swash plate chamber defined in said combined cylinder block, and; a plurality of compressor pistons engaged with said swash plate and being reciprocable within said respective cylinder bores of said horizontal combined cylinder block, wherein at least one of the cavities formed between said neighbouring cylinder bores of said horizontal combined cylinder block is provided as a horizontal suction passageway, at least one pair of inlet ports are formed in the bottom surface of said suction passageway for communicating said suction passageway with said swash plate chamber, one being located at a position radially outwardly remote from the center of said horizontal combined cylinder block and the other being located at another position radially inwardly close to the center of said horizontal combined cylinder block, and through-holes for connecting said suction passageway and said suction chambers of said front and rear housings are provided above said pair of inlet ports, respectively.

4,432,703

ADJUSTING ARRANGEMENT FOR A HYDRAULIC PUMP WITH VARIABLE DISCHARGE FLOW QUANTITY

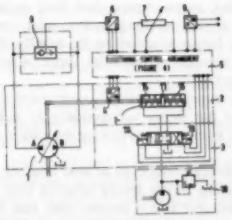
Gerhard Beutler, Nagold; Heinz Berthold, Horb; Joachim Morsch, St. Wendel, and Karl Schiene, Sulzbach, all of Fed. Rep. of Germany, assignors to BSO Steuerungstechnik GmbH Industriestrasse, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,064

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044515

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—217 **16 Claims**



1. An adjusting arrangement for a hydraulic pump having a variable discharge flow, said arrangement comprising:

(a) a first means for adjusting the angle of traverse for said pump to vary the discharge flow of said pump, said first means responsive to a variable pilot pressure;

(b) a first control means for translating electronic control signals to variable pilot pressure signals for said first means;

(c) an electronic control means, said electronic control means having:

(i) a means for generating a signal proportional to the angle of traverse of said pump representing an actual discharge flow quantity;

(ii) a means for normalizing input parameters of said electronic control means with respect to a predetermined set of maximum permissible values said input parameters including a rated discharge flow quantity, said actual discharge flow quantity, and an actual discharge pressure;

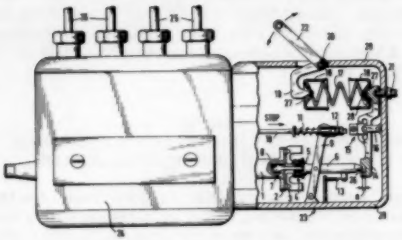
(iii) a means for introducing boundary values to said electronic control means;

(iv) a regulator means for generating said electronic control signals provided to said first control means, said regulator means deriving said electronic signals from said angle of traverse signal, said normalized input parameters and said boundary values.

4,432,704
MECHANICAL SPEED REGULATOR FOR AN INJECTION PUMP

Max Matzen, Leverkusen, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 92,991, Nov. 9, 1979, abandoned. This application Dec. 3, 1981, Ser. No. 327,013
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849093
Int. Cl.³ F02D *1/10*
U.S. Cl. 417—294 **8 Claims**



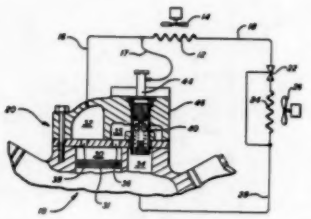
1. A mechanical speed regulator for an injection pump, which comprises in combination
a housing for said regulator flanged thereto;
a drive shaft operatively connected to said pump;
centrifugal weights operatively connected to said drive shaft;
a control pin operatively connectible to said drive shaft;
a supplementary extra-starting-fuel feed spring operatively connected to said housing and to said control pin, said control pin being adapted to be axially shifted by said centrifugal weights against the force of said supplementary feed spring;
control spring means operatively connected to said housing, said control pin being substantially in equilibrium with said control spring means during operation of said regulator;
a beam operatively connected to said housing in such a way as to be able to swing freely relative thereto, said beam having a first end and a second end, said first end being adapted to engage said control pin, and said second end engaging said control spring means, said control spring means being a pressure spring arranged in such a way that its central axis is substantially parallel to said control pin and that it is adapted to have the said direction of force as said control pin, said housing including an adjustable stop located substantially coincidental with the extension of the central axis of said pressure spring, said second end of said beam being interposed between said pressure spring and said stop and being adapted to be engaged by said stop.

4,432,705
REFRIGERATION COMPRESSOR CAPACITY CONTROL MEANS AND METHOD

Bruce A. Fraser, Chittenango, and Curtis Holt, Jr., East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 944,237, Sep. 20, 1978, abandoned. This application Aug. 28, 1980, Ser. No. 182,167
Int. Cl.³ F04B *49/02*
U.S. Cl. 417—295 **5 Claims**

1. Capacity control apparatus for a multi-cylinder refrigerant compressor employed in a mechanical refrigeration unit comprising:
means defining a manifold for delivering refrigerant vapor to less than all of the cylinders of the compressor;
a housing disposed between the manifold and the cylinders receiving refrigerant vapor therefrom for conducting refrigerant vapor from the manifold to these cylinders;
a piston reciprocally disposed within the housing for modulating movement between open and closed positions to modulate the flow of refrigerant vapor from the manifold to the cylinders receiving vapor therefrom, the piston dividing the housing into an upper chamber spaced from the manifold, and a lower chamber in communication therewith and located between the manifold and the upper chamber;

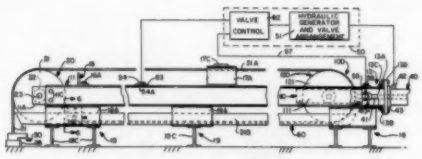


means for producing a relatively constant force in the upper chamber urging the piston to the closed position; and
means for producing a variable force in the lower chamber urging the piston to the open position, the variable force producing means including vapor entering the housing from the manifold wherein the position of the piston and the quantity of refrigerant passing through the housing modulate in response to changes in the pressure of refrigerant vapor in the manifold.

4,432,706
OIL WELL PUMP DRIVING UNIT

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94566

Continuation of Ser. No. 148,380, May 9, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,646
Int. Cl.³ F04B *47/04*
U.S. Cl. 417—399 **6 Claims**



1. In an oil well pumping apparatus which inclues a submerged reciprocating pump mounted in a tubing arrangement communicating with the wellhead, a sucker rod string extending through said tubing arrangement and connected in driving relation with said pump, and a pumping tee and stuffing box arrangement mounted on the casing of the well at the wellhead and including a sealed drive rod arrangement in the stuffing box connected in driving relation to said sucker rod string and a drive rope connected in driving relation to said sealed drive rod, a pump driving unit comprising:
a rotatably mounted sheave adapted to be positioned proximate said wellhead and to engage said drive rope to change the vertical drive direction of said drive rope to a horizontal drive direction;
a hydraulic cylinder including an in/out fluid line and a cylinder rod having a preselected length to provide a preselected maximum stroke length;
structural means mounting said hydraulic cylinder in a hori-

zontal orientation with the axis of said cylinder in the plane of said sheave;

coupling means for coupling said cylinder rod to said drive rope in a pulling relation; and

a hydraulic drive/control means for operating said hydraulic cylinder to provide a presettable operating cycle for said cylinder rod consisting of a hydraulic power upstroke and a gravity power downstroke of length presettable up to said maximum stroke length;

said structural means comprising an elongated horizontally disposed draw works having a foot end structure adapted to be placed proximate said wellhead and to support said rotatably mounted sheave, a head end structure adapted to mount said hydraulic cylinder and a body structure defining a horizontally disposed carriage channel having a length greater than said maximum operating stroke length; and said coupling means comprises a carriage assembly adapted to traverse said carriage channel, a second sheave of diameter substantially identical to said first sheave and rotatably mounted on said carriage assembly in a plane substantially coincident with the plane of the first sheave and adapted to engage said drive rope to reverse the direction of said drive rope by 180 degrees, a rope termination assembly mounted on said draw works for terminating said drive rope at a position proximate said first sheave, and a coupler assembly for coupling said carriage assembly to said cylinder rod.

4,432,707

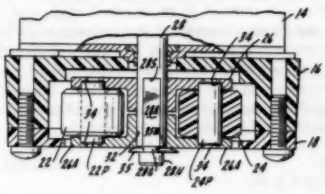
ROLLER ASSEMBLY FOR PERISTALTIC PUMP

David S. Anderson, and Lawrence F. Kottke, both of Bradenton, Fla., assignors to Anko Motors, Inc., Bradenton, Fla.

Filed Jun. 21, 1982, Ser. No. 390,386

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—477 **4 Claims**



1. A roller assembly to be mounted on the motor driven shaft of a peristaltic pump, the pump having a bent flexible tube containing a fluid to be pumped by revolving rollers which constrict the tube with a regular intermittence, comprising:

a pair of brackets each having a centrally located motor shaft opening with a keying flat aligned one to the other whereby the brackets may be keyed to a flat on the shaft in opposed relation one to the other so the brackets will rotate in unison with the shaft; and

said brackets having arms extended radially outward of the motor shaft opening and the opposed ends of the arms supporting opposed ends of pins in bracket pockets on which the rollers are rotatably mounted;

said brackets being of pressed, sintered powdered iron said brackets each having two opposed flats which may be keyed to said flat on the shaft so that a radial dimension discrepancy in the spacing of the bracket pockets may be canceled by changing the hand position of the brackets when mounting them on the shaft.

4,432,708

SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH PRESSURE COMMUNICATING PASSAGE BETWEEN POCKETS

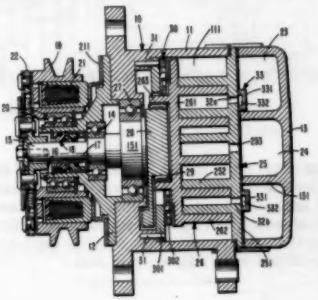
Masaharu Hiraga, Honjyo, and Seiichi Sakamoto, Gunma, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jun. 25, 1981, Ser. No. 277,108

Claims priority, application Japan, Jul. 1, 1980, 55-90390

Int. Cl.³ F01C *1/02*

U.S. Cl. 418—55 **8 Claims**



1. In a scroll type fluid displacement apparatus including a housing, a fixed scroll member fixedly disposed relative to said housing and having a first end plate from which a first wrap extends into the interior of said housing, an orbiting scroll member having a second end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism including a drive shaft rotatably supported by said housing and connected to said orbiting scroll member to effect the orbital motion, and a rotation preventing mechanism connected to said orbiting scroll member to prevent the rotation of said orbiting scroll member during the orbital motion of said orbiting scroll member, whereby said fluid pockets change volume by the orbital motion of said orbiting scroll member, the improvement comprising equalizing means for minimizing fluid pressure difference between said pair of fluid pockets and thereby reducing vibration in the apparatus, said equalizing means including two holes formed in said end plate of said fixed scroll member at symmetrical locations so that said wrap of said orbiting scroll member simultaneously crosses over said two holes, and a fluid passage means for placing said two holes in continuous fluid communication with one another.

4,432,709

INTERNALLY SHAFTED PLANETARY PISTON ENGINE

Christian B. Hansen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jul. 29, 1981, Ser. No. 288,028

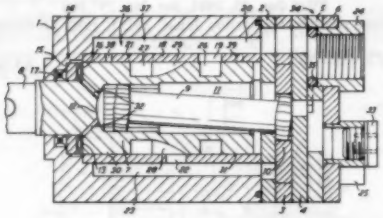
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030203

Int. Cl.³ F03C *2/00*

U.S. Cl. 418—61 B **3 Claims**

1. A hydraulic pump or motor, comprising a cylindrically shaped housing having optionally and selectable inlet and outlet ports and drive shaft bearing means at one end thereof, said housing defining a valve bore, a cylindrically shaped valve having a central bore and being rotatably disposed in said valve bore, drive shaft means journalled in said bearing means and being connected to said valve means in driving relation thereto, expansible chamber forming means in said housing at the end thereof opposite said bearing means, drive means in said central bore connecting said valve in driving relation to said expansible chamber forming means, valving means in said

valve disposed centrally thereof relative to the ends thereof, said valving means including first and second axially spaced annular grooves, first valving passages in said housing connecting said expansible chamber forming means to said valving means, second valving passages in said housing connecting said



inlet and outlet ports to said annular grooves of said valving means, lubrication passage means in said housing adjacent both ends of said central bore providing fluid communication between said second valving passages and said central bore near said ends thereof to provide lubrication for the outer surface of the ends of said valve adjacent said ends.

4,432,710

ROTARY TYPE MACHINE WITH CHECK VALVES FOR RELIEVING INTERNAL PRESSURES

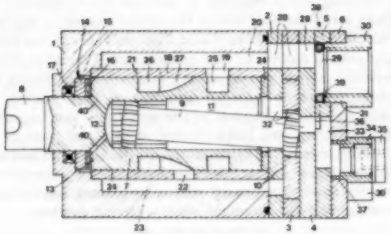
Christian B. Hansen, Nordborg, and Carl O. Flagstad, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 132,306, Mar. 20, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 363,901

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910831

Int. Cl.[3] **F03C** *2/22*; **F04C** *2/22, 15/00*; **F16K** *15/14*

U.S. Cl. 418—61 B **1 Claim**



1. A hydraulic pump or motor, comprising, a housing defining a central bore and an inlet and outlet passage means, said housing having axially oriented inlet and outlet ports at one end thereof having respective fluid communication with said passage means, expansible chamber means at said one end of said housing and drive shaft means rotatably supported at the other end of said housing, annularly shaped valve means rotatably mounted in said housing bore and forming an inner bore, said drive shaft means being connected to said valve means, drive means in said valve means inner bore connecting said valve means to said expansible chamber means, said housing having an end part surrounding said drive shaft means, an annular bearing plate surrounding said drive shaft means, said plate engaging said housing end part and forming therewith an annular groove surrounding said drive shaft means, an annularly shaped shaft seal in said groove, said valve means having a shoulder part adjacent said bearing plate, bearing means between said valve means shoulder part and said bearing plate, said housing being formed in part with a circular plate section adjacent said one end thereof, said circular plate section having an aperture in fluid communication with said housing central bore and first and second bores forming portions of said housing inlet and outlet passage means, first and second passages between said aperture and said first and second bores, first and second O-rings in said first and second bores forming first and second check valve means between said valve means inner bore and said inlet and outlet ports which are respectively openable in the direction of said ports to limit the magnitude of fluid pressure in said inner bore and thereby limit the magnitude of forces applied to said bearing means, said bearing plate and said shaft seal.

4,432,711

VANE PUMP WITH CYLINDER PROFILE DEFINED BY CYCLOID CURVES

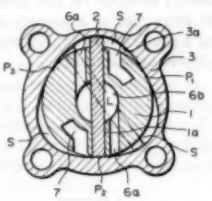
Keiji Tsuchiya; Hideaki Sasaya, and Akio Nara, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 2, 1981, Ser. No. 317,407

Claims priority, application Japan, Nov. 7, 1980, 55-157403; Jun. 10, 1981, 56-88012

Int. Cl.[3] **F04C** *2/00*

U.S. Cl. 418—150 **6 Claims**



1. A vane pump comprising a cylindrical rotor connected to and driven by a drive, said rotor being provided with a diametrically extending vane groove, a vane slidably arranged in said vane groove in radial directions, a cylinder in which said rotor is rotatably arranged about its center axis, said cylinder having an inner peripheral cam surface with which said vane always comes into slide contact at its opposed ends, and a pair of opposed end plates connected to the cylinder to define pumping chambers between the rotor and the cylinder, said cam surface of the cylinder having a profile defined by cycloid curves wherein said cam surface of the cylinder has a profile consisting of continuously connected cycloid curves which are represented by the following equations:

$$0 \leq \theta \leq \frac{\pi}{3}$$

$$R = A + \delta \cdot \left(\frac{\theta}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta \right)$$

$$\frac{\pi}{3} \leq \theta \leq \frac{2\pi}{3}$$

$$R = A + \delta - \delta \cdot \left(\frac{\theta'}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta' \right)$$

wherein $\theta' = \theta - \frac{\pi}{3}$

$$\frac{2}{3}\pi \leq \theta \leq \pi$$

$$R = A + \delta \cdot \left(\frac{\theta'}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta' \right)$$

-continued

wherein $\theta' = \theta - \frac{2}{3}\pi$

$$\pi \leqq \theta \leqq \frac{4}{3}\pi$$

$$R = A + \delta - \delta \cdot \left(\frac{\theta'}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta' \right)$$

wherein $\theta' = \theta - \pi$

$$\frac{4}{3}\pi \leqq \theta \leqq \frac{5}{3}\pi$$

$$R = A + \delta \cdot \left(\frac{\theta'}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta' \right)$$

wherein $\theta' = \theta - \frac{4}{3}\pi$

$$\frac{5}{3}\pi \leqq \theta \leqq 2\pi$$

$$R = A + \delta - \delta \cdot \left(\frac{\theta'}{\theta_h} - \frac{1}{2\pi} \sin \frac{2\pi}{\theta_h} \theta' \right)$$

wherein $\theta' = \theta - \frac{5}{3}\pi$

wherein:

R; a radius vector, i.e., the distance between the center axis of the rotor and the cam surface

A; the radius of the rotor

θ; a phase [rad.] of the vector R

δ; the maximum radial displacement (lift) of the vane

θ_h; a phase [rad.] of the vector R at the maximum radial displacement of the vane.

4,432,712

HYDROSTATIC GEAR RING MACHINE

Siegfried Eisenmann, Conchesstrasse 25, 7960 Aulendorf, Fed. Rep. of Germany

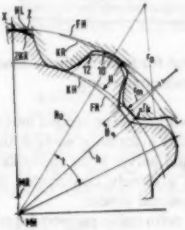
Continuation-in-part of Ser. No. 279,042, Jun. 30, 1981, Pat. No. 4,398,874. This application Dec. 18, 1981, Ser. No. 332,355

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026222

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ F04C 2/10

U.S. Cl. 418—171 **15 Claims**



1. A hydrostatic gear ring machine, comprising a housing having an inner hollow and defining an inlet side and an outlet side; a hollow gear arranged in said housing and provided with between eight and sixteen teeth; a driven pinion with further teeth having by one tooth less than said hollow gear and engaging with said hollow gear so as to form a region of deepest engagement and a region which is opposite to the latter, the teeth heads of said pinion sliding over the teeth of said hollow gear in the opposite region whereas the teeth flanks of said pinion abut against the teeth of said hollow gear in said region of deepest engagement in a driving engagement so as to provide sealing between said inlet side and outlet side, said teeth being formed so that the teeth heads of said pinion are freely received into the teeth gaps of said hollow gear and the teeth of said pinion have a shape determined by rolling of said pinion over said hollow gear, the teeth of said hollow gear having an approximately trapezoidal shape with convexly curved flanks and heads.

4,432,713

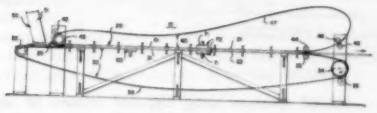
MACHINE FOR THE CONTINUOUS MOLDING OF POLYSTYRENE

Rolf E. Berner, R.D. #6, New Castle, Pa. 16103

Filed Aug. 20, 1982, Ser. No. 409,934

Int. Cl.³ B29D 27/00

U.S. Cl. 425—4 C **10 Claims**



1. In apparatus for the continuous molding of polystyrene, wherein granules of polystyrene containing a heat-activated expansion agent are converted into a coherent agglutinated body, of the type having an open-ended molding chamber with an inlet end and an outlet end, means for feeding said polystyrene granules to said inlet end of said chamber, means for continually moving said polystyrene through said molding chamber, and means for subjecting said moving polystyrene granules to heat to cause their expansion, the improvement comprising:

said molding chamber having stationary interior wall surface portions that operate to limit the expansion of said polystyrene granules in order to produce a dimensionally stable cross-section in said agglutinated body;

said continually moving means including at least one endless belt having a working segment confined within said molding chamber and a return segment subjected to substantially no longitudinal tensile force; and

means associated with said stationary wall surface portions that are in direct contact with said agglutinated body for minimizing the frictional forces presented by said stationary wall surface portions.

4,432,714

APPARATUS FOR FORMING BUILDING MATERIALS COMPRISING NON-WOVEN WEBS

John S. Forry, Manor Township, Lancaster County, and John R. Garrick, Lancaster, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 16, 1982, Ser. No. 408,059

Int. Cl.³ B29C 13/00

U.S. Cl. 425—83.1 **15 Claims**

1. Apparatus for forming a non-woven web, said apparatus comprising:

(A) preparation means for preparing a mixture comprising a binder and principally inorganic fibrous material,

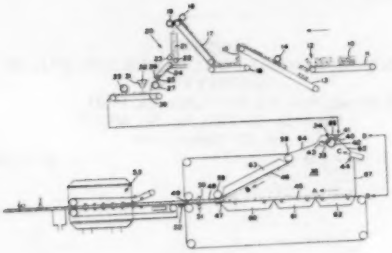
(B) a mat-forming zone feedibly associated with said preparation means so as to receive said mixture, said mat-forming zone comprising,

(1) a first aperture in the upper region thereof, said aperture comprising means for introducing said mixture therethrough,

(2) a second aperture disposed therein such that air introduced through said second aperture is horizontally or

upwardly directed so as to intersect and entrain therein said mixture, said second aperture having means associated therewith for controlling the direction of the air which passes therethrough,

(3) a first moveable foraminous wire disposed in the lower region of said mat-forming zone, said wire exiting said mat-forming zone through a nip opening, and, optionally, a second moveable foraminous wire disposed so as to converge with said first foraminous wire at said nip opening, said optional second foraminous wire and said



second aperture being disposed relative to said first foraminous wire such that said mixture is deposited essentially uniformly on said wires,

(4) means for adjustably exhausting the entraining air through said foraminous wires to selectively deposit said mixture thereupon, and

(5) means for moving said first foraminous wire and said optional second foraminous wire to said nip opening to form a non-woven web of material, and

(C) means for consolidating and heating said web and setting said binder.

4,432,715

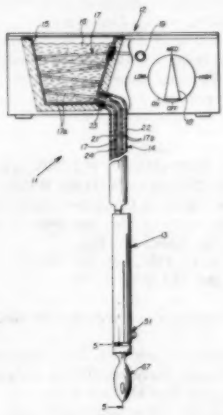
MOLTEN MATERIAL DISPENSING APPARATUS

Duk K. Ghim, 11 Merlin St., Framingham, Mass. 01701

Filed Mar. 1, 1982, Ser. No. 353,492

Int. Cl.³ B29F *5/00*; B29D *9/00*

U.S. Cl. 425—87 **7 Claims**



1. A molten substance dispenser comprising: container means for a liquified substance to be dispensed; applicator means for receiving the liquified substance from said container means and for applying the substance to a work piece, said applicator means adapted for hand manipulation and defining a discharge port for dispensing the liquified substance flowing from said container means;

flexible tube means connected between said container means and said applicator means and adapted to accomodate the flow of the liquified substance therebetween;

heater means for heating the liquified substance in each of said container means, said applicator means, and said flexible tube means; said heater means comprising electrically conductive wire means extending through said flexible tube, and power supply means for producing heating current flow through said wire means; and

valve means for controlling the flow of the liquified substance and supported by said applicator means; said valve means comprising a valve member for controlling the flow through said discharge port, bias means biasing said valve member in a closed position, and an operator for opening said valve member and adapted for operation by a finger on a hand manipulating said applicator means; said operator being a manually actuated cam member which forcibly engages said valve member to produce movement thereof toward an open position.

4,432,716

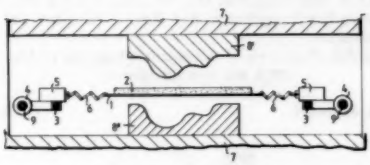
APPARATUS FOR MOULDING THREE-DIMENSIONALLY SHAPED MOULDED ARTICLES FROM BINDER-CONTAINING WEB-LIKE NON-WOVEN FABRICS

Günter H. Kiss, Berlin, Fed. Rep. of Germany, assignor to Lignotock Verfahrenstechnik GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,948

Int. Cl.³ B28B *7/36*

U.S. Cl. 425—89 **7 Claims**



1. An apparatus for forming three-dimensional articles from non-woven fabrics comprising:

a mould;

the mould having first and second mould halves, at least one of which has a forming surface thereon, the first and second mould halves being movable from a spaced apart position to a closely conforming position to form the three-dimensional article;

an elastically deformable support layer for transmitting the shaping forces from at least one of the first and second mould halves to the fabric;

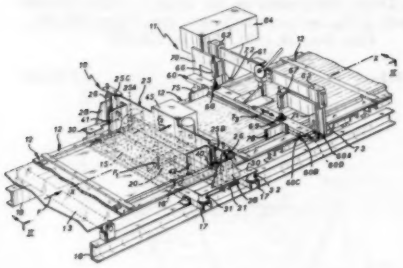
means for supporting the support layer between the first and second mould halves; and

means, attached to the supporting means and the support layer, for resiliently stretching the support layer during the moulding process such that the support layer follows the shaping forces without using its inherent elasticity until the moulding process nears completion.

4,432,717
APPARATUS FOR FILLING MOLDS CARRIED ON A CONVEYOR BELT

Bernard Viemon, Trelaze, France, assignor to SAFAMA S. A., Angers, France

Filed Feb. 5, 1982, Ser. No. 346,156
Claims priority, application France, Apr. 11, 1981, 81 20657
Int. Cl.³ B28B 1/08
U.S. Cl. 425—429 14 Claims



1. An apparatus for filling molds in motion carried by a conveyor belt, said conveyor belt having a path of movement running between a filling unit for filling said molds with molding material and a finishing unit for smoothing the top surface of the molding material in said molds, said filling unit comprising a vibrating table, a section of said conveyor belt at said filling unit bearing against said vibrating table to impart essentially vertical vibrations to said section of said conveyor belt and thereby to said mold in said section of said conveyor belt, a distributor member extending transversely of said conveyor belt, said distributor member having a lower edge located slightly above a plane defined by the free upper edges of said molds, means for supplying molding material being disposed immediately ahead of the distributor member relative to the direction of movement of said conveyor belt, said distributor member spreading molding material in said mold at said filling unit by the relative displacement of said conveyor belt, means imparting essentially horizontal vibrations to said distributor member, parallel to the path of movement of said conveyor belt, said finishing unit comprising a smoothing member, and means imparting essentially horizontal vibrations to said smoothing member, said smoothing member being displaceable transversely of the path of movement of said conveyor belt, and means for reciprocating said smoothing member transversely of the path of movement of said conveyor belt in a manner wherein said smoothing member eliminates surface irregularities in the top surface of the molding material produced by vertical vibrations imparted by said distributor member.

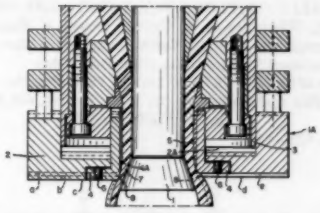
4,432,718
EXTRUSION HEAD

Ernst Wurzer, Konigswinter, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,507
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043228
Int. Cl.³ B29F 3/04
U.S. Cl. 425—466 4 Claims

1. In an extrusion head having a central axially extending die core member and an outer surrounding die casing ring member cooperating to define an annular die extrusion gap for fabricating a hollow extrudate, the die core member having a wall forming the inner boundary of the die gap and the casing ring member having a wall forming the outer boundary of the die gap, one of said walls having a tapered surface extending in said axial direction whereby relative axial movement of said members uniformly changes the radial thickness of the die gap, the improvement wherein:

(a) at least one of the boundary walls forming the die gap includes a plurality of independently axially adjustable sections disposed in side by side relationship about the



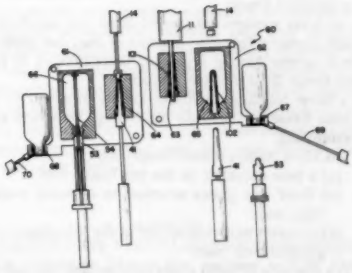
periphery thereof whereby axial adjustment of any section varies the local radial width of the die gap defined by that section; and

(b) means to adjust the plurality of independently axially movable sections to change the die gap at any and all locations around the periphery of the die opening.

4,432,719
APPARATUS FOR FORMING A BLOWN THERMOPLASTIC ARTICLE

Robert X. Hafele, Baton Rouge, La., assignor to Hoover Universal Inc., Ann Arbor, Mich.

Division of Ser. No. 97,230, Nov. 26, 1979, Pat. No. 4,315,888.
This application Feb. 12, 1982, Ser. No. 348,205
Int. Cl.³ B29C 17/07
U.S. Cl. 425—526 3 Claims



1. An apparatus for forming a blown thermoplastic article, comprising:

(a) means for extruding an essentially tubular parison of thermoplastic material;

(b) a preform mold having sections which are closeable around the parison, thereby leaving at least one end of the parison open and enclosing the parison within a preform cavity;

(c) means for radially expanding the parison with a differential pressure in order to enlarge the parison to essentially the shape of the preform mold, and holding the enlarged parison against the preform mold to accommodate the insertion of a core pin;

(d) a tapering core pin insertable into the open end of the enlarged parison into essentially the entire length of the enlarged preform for compressing the parison between the core pin and the preform cavity to form a preform and for thermally conditioning the preform;

(e) a blow mold having sections which are closeable around

the thermally conditioned preform for enclosing the preform within a blow mold cavity; and

(f) means for expanding the preform to the shape of the blow mold cavity.

4,432,720

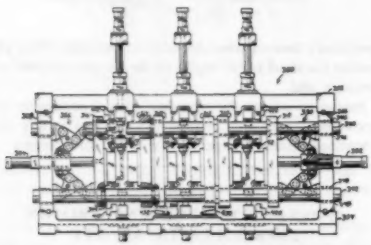
APPARATUS FOR HIGH RATE PRODUCTION OF BIAXIALLY ORIENTED THERMOPLASTIC ARTICLES

James G. Wiatt; James W. Calvert; Samuel L. Belcher, all of Cincinnati, and Roger D. Smith, Bethel, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 257,468, Apr. 24, 1981, Pat. No. 4,382,760. This application Jan. 25, 1983, Ser. No. 460,830

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—534 **5 Claims**



1. An apparatus for high rate production of biaxially oriented articles from thermoplastic article preforms, each article preform having a formable portion and a neck portion, the formable portion being biaxially expanded when its temperature is at a near the molecular orientation temperature of the thermoplastic, the apparatus comprising:

(a) a machine frame;

(b) preform carriers suspended from the machine frame, each carrier releasably retaining at least one preform, and each carrier having a passage therethrough to admit an expansion fluid into the preform;

(c) a blow molding apparatus rigidly attached to the machine frame for biaxially expanding the article preforms comprising

(1) a blow station frame comprising

(a) a base mounted on the machine frame

(b) fixed side plates attached to opposite ends of the base, and

(c) a crown mounted on top of the side plates and lying parallel with base,

(2) a plurality of mold guide rods passing through the side plates and slidably supported thereby, the guide rods being operatively associated in pairs comprising first and second sets thereof,

(3) a first set of mold sections rigidly connected to and disposed along the first set of guide rods between the side plates and slidably supported upon the second set of guide rods,

(4) a second set of mold sections consisting of mating mold sections for the first set of mold sections, the first and second mold sections defining mold cavities, and the second set of mold sections being rigidly connected to and disposed along the second set of guide rods between the side plates and slidably supported on the first set of guide rods.

(5) first and second hydraulic actuators for respectively imparting motion to the first and second sets of guide rods, each actuator being respectively connected between a side plate and a mold section of the first and second sets of mold sections, the imparted motion closing mating mold sections together to surround preforms and opening mating mold sections to permit passage of expanded articles therebetween, and

(6) mold pressurizing means supported by the crown and disposed thereupon to introduce a pressurized expansion fluid into the preforms through the passage while the preforms are positioned within the mold cavities.

4,432,721

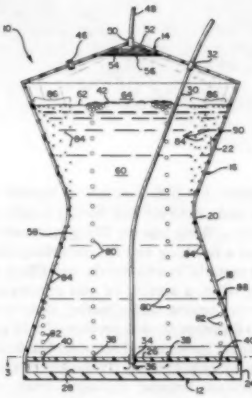
COMBUSTION AIR BUBBLE CHAMBER METHOD

Alyce D. Evans, Shiremanstown, and John R. Hilty, Thomasville, both of Pa., assignors to Testco, Inc., Camp Hill, Pa.

Filed Dec. 29, 1981, Ser. No. 335,278

Int. Cl.³ B01F *3/04*

U.S. Cl. 431—4 **8 Claims**



1. A method of supplying humidified air to a combustion device, comprising bubbling air into water within a bubble chamber, flowing the bubbles upwardly against a downwardly facing inclined surface, attaching the bubbles to such surface, transferring the bubbles from the top of such surface around a smooth, gradual transition surface to the bottom of an upwardly facing surface sloping across the chamber, attaching the bubbles to such upwardly facing surface, moving the bubbles upwardly along such surface, releasing the bubbles along such surface at different locations to form a relatively uniform flow of bubbles floating up to the water surface, humidifying the air in the bubbles as they move upwardly in the water, collecting the vapor above the surface of the water, and conducting the collected vapor to the combustion device.

4,432,722

INTERRUPTED POWER HOT WIRE GAS IGNITION CONTROL SYSTEM

John E. Bohan, Jr., Minneapolis, and Brian J. Hinton, Crystal, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

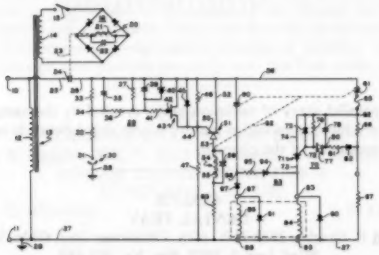
Filed Jul. 13, 1981, Ser. No. 282,566

Int. Cl.³ F23Q *9/08*

U.S. Cl. 431—46 **10 Claims**

1. An interrupted power hot wire gas ignition control system adapted to control a burner having gas valve means incorporating a pilot valve and a main valve, including: a negative temperature coefficient resistor-ignitor element which when energized from a potential changes in resistance value as the resistor-ignitor element heats to an ignition temperature with said element mounted at said burner; a series ignition circuit including a normally closed relay contact, a resistor, and said resistor-ignitor element with said ignition circuit adapted to be connected to a source of potential upon operation of said burner; switch means connected to energize said pilot valve;

switch control circuit means connected to said resistor to control said switch means, and wherein said switch means is nonconductive when said resistor-ignition element is cold, and further wherein said switch means is conductive to energize said pilot valve when said resistor-ignition element is at a gas ignition temperature; flame detector means mounted at said burner to detect the presence of a flame when said pilot valve has opened with said resistor-ignitor element at said gas ignition temperature; flame responsive circuit means having an input connected to said flame detector means, and said flame responsive circuit means having switched output means; said switched output means including a relay having a normally



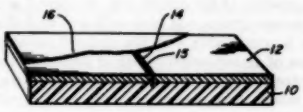
open relay contact, and further including said normally closed relay contact; said normally open relay contact connected to said main valve to allow said normally open relay contact when closed to energize said main valve; and impedance means including a diode connecting said pilot valve to said normally open relay contact; said relay being energized upon the sensing of flame at said burner by said flame detector means with said normally closed relay contact becoming open circuited to remove power from said resistor-ignitor element while said normally open relay contact becomes closed circuited to maintain said pilot valve energized through said impedance means, and to also energize said main valve.

4,432,723

MULTILAMP PHOTOFLASH UNIT WITH IMPROVED QUICK-DISCONNECT SWITCH

Andre C. Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 12, 1982, Ser. No. 397,308
Int. Cl.³ F21K 5/00
U.S. Cl. 431—359 **17 Claims**



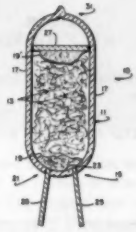
1. In a multilamp photoflash unit containing a plurality of flashlamps and circuit means for sequentially igniting said flashlamps, at least one quick-disconnect switch included in said circuit means and being electrically connected in series with one of said flashlamps for interrupting the ignition circuit means for said flashlamp after said flashlamp is ignited, said disconnect switch comprising a length of polymeric material which is rendered electrically conductive by a deposit of conductive material on at least a portion of the surface of said length of polymeric material, said conductive material having a gap disposed therein extending substantially transverse to the length thereof, and a quantity of primer material disposed within said gap, whereby the disconnect switch is severed by ignition of the primer from a high voltage pulse imposed across the primered gap.

4,432,724

PHOTOFLASH LAMP INCLUDING IMPROVED IGNITION MEANS

Andre C. Bouchard, Peabody, and Robert F. Craig, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 1, 1982, Ser. No. 353,316
Int. Cl.³ F21K 5/00
U.S. Cl. 431—362 **12 Claims**



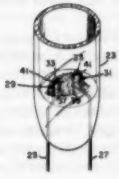
1. In a photoflash lamp including an elongated, light transmitting envelope, a quantity of combustible, light-producing material having a shredded configuration and located within said envelope, and ignition means for igniting said shredded combustible material, the improvement wherein said ignition means includes a first quantity of primer material located within a first end of said envelope adjacent a first portion of said shredded combustible material, a pair of lead-in wires secured within said envelope and electrically connected to said first quantity of primer material for igniting said first quantity of primer material upon application of a suitable pulse across said lead-in wires, a thin member located within a second, opposing end of said envelope from said first quantity of primer material, and a second quantity of primer material positioned on said thin member adjacent a second portion of said shredded combustible material, said first quantity of primer material igniting said second quantity of primer material and said first portion of said shredded combustible material in a substantially simultaneous manner whereupon said second quantity of primer material ignites said second portion of said shredded combustible material to cause said shredded combustible material to burn from said first and second portions toward the center thereof.

4,432,725

SUBMINIATURE FLASHLAMP MOUNT DESIGN

Ronald E. Sindlinger, Muncy, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 20, 1982, Ser. No. 380,592
Int. Cl.³ F21K 5/02
U.S. Cl. 431—362 **12 Claims**



6. A photoflash lamp comprising:
a light transmittable envelope;
a charge of filamentary combustible material located within said light transmittable envelope;

a combustion supporting gas contained within said light transmittable envelope; and

an ignition means located witin said light transmittable envelope in operative relationship to said filamentary combustible material, said ignition means including a pair of electrical conductors sealed into and passing through one end of said light transmittable envelope with each of said pair of electrical conductors bent to form a loop within said envelope, and a primer material substantially bridging said loops of said pair of electrical conductors.

4,432,726

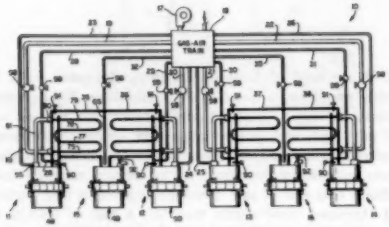
CENTRALIZED LADLE HEATING AND DRYING SYSTEM

Grigory M. Gitman, Duluth, Ga., assignor to The Cadre Corporation, Atlanta, Ga.

Filed Sep. 16, 1982, Ser. No. 418,798

Int. Cl.³ F27D *3/00*; C21B *9/00*; F24J *3/00*

U.S. Cl. 432—9 **18 Claims**



1. A method of simultaneously preheating a plurality of ladles and drying at least one other ladle comprising

engaging the rim of each ladle with a lid including a heat resistant soft fibrous material that substantially closes the ladle,

moving combustion air first through a heat exchanger and then through the lids of and into the ladles to be preheated,

combining fuel with the combustion air and burning the combustion air and fuel in the ladles to be preheated,

moving the exhaust gases from the ladles being preheated through the lids of each ladle and through the heat exchanger,

collecting the exhaust gases moved through the heat exchanger,

moving the collected exhaust gases from the heat exchanger through the lids of and into the ladles to be dried, and

exhausting the gases from the ladles to be dried.

4,432,727

GAS-FIRED INFRARED PROJECTION HEATER

Joseph Fraioli, 8 Seymour Pl., White Plains, N.Y. 10605

Filed Sep. 21, 1982, Ser. No. 420,927

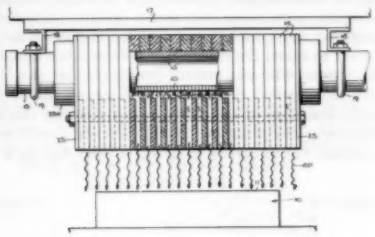
Int. Cl.³ F23D *23/00*

U.S. Cl. 432—227 **14 Claims**

1. A gas-fired infrared heater for projecting an infrared beam in a radiation pattern having a predetermined geometry for irradiating the surface of a body to effect substantially uniform heating thereof, said heater comprising:

A. a gas-fired burner constituted by a cylinder supplied with a combustible air-gas mixture, said cylinder having a longitudinal slot occupied by corrugated ribbons whereby emitted therefrom is a sheet of flame; and

B. an assembly formed by a stack of identical slabs of refractory material having a bore extending therethrough to receive said cylinder, each slab having a sector-shaped channel cut into one face thereof to define a fin parallel to said one face and side walls that diverge from the bore to create a flattened infrared radiation horn whose mouth is aligned with the burner slot whereby the surface of the assembly on which the flame impinges is heated to a temperature level causing it to emit infrared radiation, the



parallel array of radiation horns created by the assembly producing a radiation pattern whose shape depends on the geometry of the channel.

4,432,728

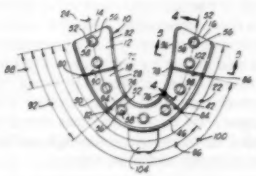
DENTAL TRAY

Floyd E. Skarky, 2233 NW. 46th, Oklahoma City, Okla. 73112

Filed Aug. 7, 1978, Ser. No. 931,464

Int. Cl.³ A61C *9/00*

U.S. Cl. 433—37 **2 Claims**



1. A dental tray comprising:

a base having opposite ends, a lingual side, a buccal side, a first surface and a second surface, the base extending in a dental arch generally between the opposite ends of the base an arcuate distance at least sufficient such that a portion of the first surface is disposable generally above some portion of the occlusal surfaces and such that a portion of the first surface of the base is disposable generally above some portion of the incisal edges in one operating position of the dental tray, the dental arch extending an arcuate distance at least sufficient such that the dental tray is contactable with the occlusal surfaces and incisal edges of an individual's teeth at three reference points to substantially prevent rotation of the dental tray and resulting model about an axis generally parallel with the dental arch axis and to substantially prevent rotation of the dental tray and resulting model about an axis generally perpendicular with the dental arch axis;

a lingual sidewall connected to the lingual side of the base and extending a distance from the first surface generally perpendicularly from the base and terminating with an edge;

a buccal sidewall connected to the buccal side of the base and extending a distance from the first surface generally perpendicularly from the base and terminating with an edge, the edges of the lingual and the buccal sidewalls being disposed in a generally common plane and the lingual and the buccal sidewalls cooperating with the first surface of the base to form a space for accommodating molding material during one operating aspect of the dental tray, and the lingual sidewall and the buccal sidwall each extending a surface molding distance from the base,

the surface molding distances being such that the lingual and the buccal sidewalls extend a minimum distance along the lingual and buccal edges of an individual's teeth and such that the edges of the lingual and the buccal sidewalls are each spaced a distance from the individual's gum in the one operating position of the dental tray; and

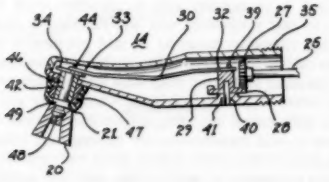
a plurality of first projections connected to the first surface and spaced generally between the opposite ends of the base, each first projection being connected to the first surface and extending a distance generally perpendicularly from the first surface terminating with an edge, the edges of the first projections being disposed in a generally common plane spaced a distance generally below the planar disposition of the edges of the lingual and the buccal sidewalls, each first projection having an opening intersecting the edge and extending a distance therethrough to a position generally near the first surface.

4,432,729

PERSONAL HEALTH CARE DEVICE

John B. Fattaleh, 4937 N. 43rd St., Phoenix, Ariz. 85018

Filed Apr. 23, 1982, Ser. No. 370,878
Int. Cl.³ A61C *1/07, 3/03*
U.S. Cl. 433—118 **23 Claims**



1. A personal health care device comprising:

(a) containment means for housing a drive mechanism therein and having an operative end and a body portion;

(b) power drive means mounted in said containment means and having an output shaft extending therefrom, the actuation of said power drive means providing rotation of said output shaft;

(c) drive means mounted for rotation about a first axis at an angle to the axis of said output shaft and operatively coupled thereto;

(d) driven means mounted in said operative end for rotation about a second axis at an angle to the axis of said output shaft;

(e) an elongated rigid link coupled to said drive means a first distance from said first axis and coupled to said driven means a second distance from said second axis, said first distance being less than said second distance whereby rotation of said drive means imparts an oscillatory motion to the rotation of said driven means;

(f) engaging means affixed to said driven means and extending outwardly of said operative end for receiving an appliance thereon.

4,432,730

SOFT AND FIRM DENTURE LINER FOR A COMPOSITE DENTURE AND METHOD FOR FABRICATING

Lawrence Gettleman, Metairie, La.; Charles L. Farris, Satellite Beach, Fla.; H. Ralph Rawls, and Ralph J. LeBouef, Jr., both of New Orleans, La., assignors to Gulf South Research Institute, Baton Rouge, La.

Filed Oct. 1, 1982, Ser. No. 432,248
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—168 **18 Claims**

1. Method for forming a substantially non-toxic composite denture of improved physical characteristics comprising:

(a) lining a curable acrylate polymer denture base material with a denture liner material comprising a phosphonitrilic fluoroelastomer and an interpenetrating C_1–C_6 alkyl methacrylate monomer composition curable at a temperature of 100° C. or less under atmospheric pressure; and

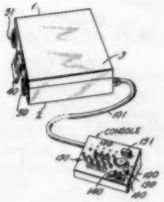
(b) subjecting the lined denture base material to a temperature of about 100° C. or less at atmospheric pressure to concurrently cure the denture liner material and denture base material and to bond them together to form a composite denture.

4,432,731

BOMB SQUAD TRAINING DEVICE

John M. Batchie, 56 Longview Ave., White Plains, N.Y. 10605

Filed Sep. 30, 1982, Ser. No. 432,062
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—11 **10 Claims**



1. A training system for personnel dealing with explosives comprising:

a portable enclosed unit comprising simulated explosive means having triggering assembly means including detecting means responsive to at least one of movement of said unit or impingement of light on said unit to provide at least one control signal, whereby said detecting means provides a control signal simulating a triggering explosive signal;

a separate, remotely coupled sensing console;

said sensing console including identification means coupled to said triggering assembly means responsive to at least one of said simulated explosive signals, including indicating elements to provide an indication of a simulated explosive condition.

4,432,732

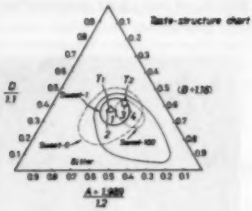
METHOD FOR PREDICTING PROPERTIES OF A CHEMICAL COMPOUND

Kunihiko Yano, c/o Yano-Miyazaki Research Laboratory, 4781-3 L-19-6, Ooba, Fujisawa-Shi, Kanagawa-Ken, Japan

Filed Jul. 26, 1982, Ser. No. 401,847
Int. Cl.³ G09B *23/24*
U.S. Cl. 434—298 **4 Claims**

1. Method for predicting properties of a chemical compound wherein, on the basis of all available information about the chemical structure and observed activities, an optimal range of

the chemical structure of a desired property is described with a control chart or the Mahalanobis' generalized distance,



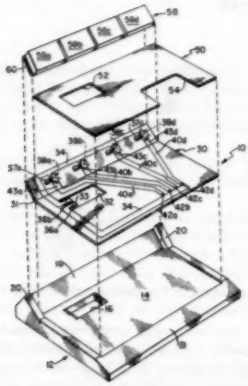
thereby the properties of the chemical compound being able to be predicted by analyzing only the chemical structure.

4,432,733

AMUSEMENT AND EDUCATIONAL GAME

Albert W. D. Carlson, Roosevelt Island, N.Y., assignor to Rivercross Learning Corp., Roosevelt Island, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,033
Int. Cl.³ G09B 7/02
U.S. Cl. 434—339 **5 Claims**



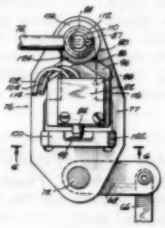
1. An electrically operated game comprising:
a base having a platform,
a template of flexible material having a pattern of electrical conductors laid down thereon, including a first and a second conductor each having a terminal for connection to a source of power,
a plurality of individual branch conductors connected in parallel with said first conductor, each said branch conductor including a light emitting diode and having an end adjacent said second conductor,
and a card having printed thereon at least one bit of conductive ink which is adapted to bridge and make electrical connection between said one of said ends of said branch conductors and said second conductor to energize the respective LED of the branch conductor, and
a mask for covering said template, said mask having a cutout defining a window in the area where said ends of said branch conductors are adjacent said second conductor, the edges of the mask surrounding said window providing a guide for a card.

4,432,734

MARINE PROPULSION DEVICE INCLUDING IGNITION INTERRUPTION MEANS TO ASSIST TRANSMISSION SHIFTING

Gerald F. Bland, Kenosha, Wis., and Donald K. Sullivan, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 11, 1982, Ser. No. 338,304
Int. Cl.³ B63H 23/04, 23/06
U.S. Cl. 440—1 **7 Claims**



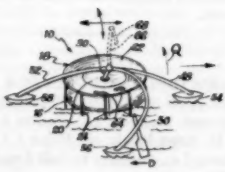
1. A marine propulsion device including an internal combustion engine, a propulsion unit, a propeller shaft rotatably mounted in said propulsion unit and carrying a propeller, a drive shaft rotatably mounted in said propulsion unit and driven by said internal combustion engine, a transmission drivingly connecting said drive shaft with said propeller shaft and movable between forward drive, reverse drive and neutral positions, shift means including a rotatable member operably connected to said transmission for moving said transmission between the forward drive, reverse drive and neutral positions in response to rotation of said member, said shift means further including a shift lever mounted on said rotatable member for rotation in common therewith, and shift assistance means including an element adapted for movement by an operator to effect shifting and carried by said shift lever for common movement therewith and for translatory movement relative to said shift lever when shift resistance to movement of said transmission from either the forward drive position or the reverse drive position to the neutral position is greater than a predetermined level and means for interrupting engine ignition in response to movement of said element relative to said shift lever.

4,432,735

HUMAN PROPELLED BUOYANT ANNULAR FLOAT WITH REMOVABLE PONTOON STABILIZER

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Oct. 26, 1981, Ser. No. 315,001
Int. Cl.³ B63H 16/08
U.S. Cl. 440—21 **8 Claims**



1. A buoyant apparatus adapted to be propelled by a human operator in a standing position comprising:
an annular float having sufficient buoyancy to support the human operator above the water;
an annular platform mounted to the upper side of the float, the

annular platform having a central disk portion and a concentric outer ring portion along the entire periphery of the disk portion which defines a surface extending angularly upwardly from the outer periphery of the disk portion upon which the human operator can walk;

a plurality of downwardly extending fins secured to the annular float at circumferentially spaced locations about the underside of the float;

means for rotatably connecting a stabilizing structure to the center of the disk portion including a mast extending through the center of the platform perpendicular to the central disk portion and a coupling removably connected to the upper end of the mast; and

a member extending vertically from the coupling and having a horizontally extending bar adapted to be pushed on by the operator to counteract torque resulting from the operator rotating the float by walking on the platform.

4,432,736

WATER-JET STEERING MECHANISMS

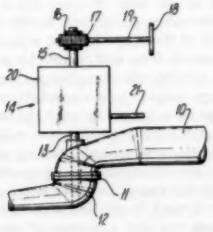
Thomas S. Parramore, Bournemouth, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 24, 1982, Ser. No. 352,606

Claims priority, application United Kingdom, Mar. 2, 1981, 8106472

Int. Cl.³ B63H *25/46*

U.S. Cl. 440—42 **3 Claims**



1. In a steering mechanism for a water-jet propelled craft having a rotatable propulsion nozzle, the mechanism including a fine steering control and a coarse reversal control each operative to rotate the nozzle, the reversal control being arranged to rotate the nozzle through 180 degrees, the improvement comprising providing means for inhibiting torque feedback from either control to the other, the steering and reversal controls being arranged to rotate the nozzle via a common differential gear box, said gear box comprising a cage containing a differential arrangement of four bevel gears rotatable in bearings retained by the cage.

4,432,737

STEERING ARRANGEMENT AT INBOARD-OUTBOARD DRIVE UNIT

Donald Johansson, Älta, Sweden, assignor to Bröderna Lindqvists Verkstäder AB, Bandhagen, Sweden

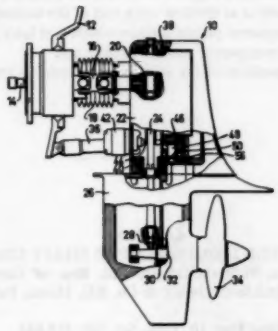
Filed Feb. 4, 1982, Ser. No. 345,730

Claims priority, application Sweden, Oct. 2, 1981, 8100921

Int. Cl.³ B63H *5/13*

U.S. Cl. 440—60 **3 Claims**

1. An assembly for steering a boat equipped with a propulsion device in the form of an inboard-outboard drive (**10**), to which the propulsive power from the engine is transmitted by a universal joint (**16**) to the gearbox (**22**) of the inboard-outboard drive and from there to an underwater housing (**26**), to which the propeller (**34**) is attached, and where the gearbox (**22**) and underwater housing (**26**) can be tilted vertically in relation to the stern (**12**) of the boat, and the gearbox (**22**) is arranged as not to be horizontally pivotal relative to the stern (**12**) of the boat, while the underwater housing (**26**) is horizontally pivotal relative to the gearbox (**22**) by means of a steering gear (**44–56**) acting between the gearbox (**22**) and the underwater housing (**26**), characterized in that the steering gear comprises a first actuated gear (**50**) meshing with two outer gears



(**52, 54**), one on each side of said first gear (**50**), said first gear and two outer gears being located in the gearbox (**22**), and that at least one of said outer gears (**52, 54**) meshes with a toothed circular segment (**56**) having a length which covers an angle of about 90° so as to allow a steering deflection of about 180°, the toothed segment (**56**) being located in the underwater housing (**26**).

4,432,738

CAMERA TUBE AND METHOD OF MANUFACTURING SAME

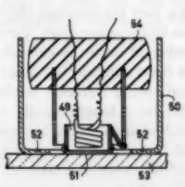
Johannes H. T. Van Roosmalen, and Franciscus C. M. De Haas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 56,481, Jul. 11, 1979, Pat. No. 4,309,638. This application May 4, 1981, Ser. No. 260,665

Claims priority, application Netherlands, Jul. 20, 1978, 7807757

Int. Cl.³ H01J *9/18*

U.S. Cl. 445—34 **3 Claims**



1. A method of manufacturing an electron gun of the type having an axis and comprising:

a cathode having a substantially planar electron emissive surface;

a cathode support having a cylindrical side and first and second open ends, the first end substantially lying in a single plane;

an electrically insulating material in which the cathode is mounted, said material and cathode being mounted in the cathode support such that the cathode is electrically insulated from the cathode support and the emissive surface is at the first open end of the cathode support; and

a substantially planar anode having an aperture therein, said

anode being attached to the first end of the cathode support;

said method comprising the steps of:

placing the first end of the cathode support on a first transparent planar surface;

placing the cathode and the electrically insulating material into the cathode support such that the emissive surface of the cathode is at the first open end of the cathode support on a transparent planar surface which is at least parallel to the first transparent planar surface; and

fixing the position of the insulating material in the cathode support.

4,432,739

SPRING STEEL LIQUID-DAMPED SHAFT COUPLING

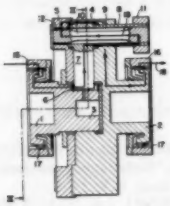
Jürgen Walter, Haltern-Hullern, Fed. Rep. of Germany, assignor to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,633

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950255

Int. Cl.³ F16D *3/00, 3/14, 3/80*

U.S. Cl. 464—24 **7 Claims**



1. An elastic shaft coupling for coupling one shaft to another wherein the shafts extend in substantially the same axial direction, which coupling includes a spring steel connection and liquid damping, the coupling comprising:

an inner coupling part for connection to one shaft;

an outer coupling part surrounding the inner coupling part for connection to the other shaft, the outer coupling part having a plurality of inwardly extending radial chambers therein which open adjacent the inner coupling;

a plurality of leaf spring elements having first and second ends connected by a longitudinally extending web, the first end of each element being secured to the inner coupling part, and the web of each spring element extending through one of the radial chambers of the outer coupling part and dividing the chamber into two sections on opposite sides of the web;

torsion tubes extending in the axial direction having first and second ends, each torsion tube being fixed adjacent its first end to the second end of one of the leaf springs;

torsion bars extending within the torsion tubes and having first and second ends, each torsion bar being fixed at its first end to the second end of the leaf spring and being fixed at its second end to the outer coupling at a location in the axial direction overlying the inner coupling part to form a relatively compact elastic coupling, and

liquid contained in the chambers for damping motion of the leaf springs as the liquid is displaced from one section of the chamber to the other due to flexing of the web of the leaf springs.

4,432,740

UNIVERSAL JOINTS AND A HOLDING CLIP FOR SUCH JOINTS

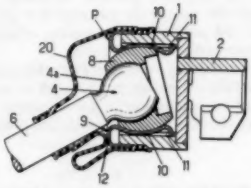
Jean P. Petiot, Massy, France, assignor to Automobiles Citroen; Automobiles Peugeot, both of Paris, France

Filed Aug. 31, 1981, Ser. No. 298,101

Claims priority, application France, Sep. 24, 1980, 80 20523

Int. Cl.³ F16D *3/22*

U.S. Cl. 464—146 **7 Claims**



1. A universal joint comprising an outer element substantially in the form of a bowl and having a cylindrical bore in which tracks are formed, an inner element housed in this bore and having a convex external surface provided with grooves, connecting means disposed respectively in the tracks of the outer element and in the grooves of the inner element, a cage to hold said connecting means in position, said cage having a concave internal surface adapted to cooperate with the convex external surface of the inner element and a convex external surface, and removable positioning means for securing the cage with respect to the outer element, wherein an expandable holding clip is used to form said removable positioning means, said expandable holding clip comprising at least two diametrically opposite lugs adapted to surround the cage and having a concave shape so as to cooperate with the external surface of the cage, said lugs being engaged in grooves formed in an inner wall of the outer element, said clip further comprising means for immobilizing the clip which is engageable with the outer element, wherein the means for immobilizing the clip on the outer element is formed by resilient curved-back hooks, each having a widened end and a portion of smaller width, said portion of smaller width being adapted to be introduced, by elastic deformation of the hook, into a notch provided in a collar on the outer element.

4,432,741

JOINT MEANS FOR TRANSMITTING A MOMENT OF ROTATION IN BOTH DIRECTIONS

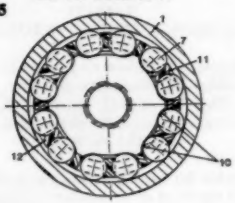
Ottmar Winkler, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,543

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028467

Int. Cl.³ F16D *3/24*

U.S. Cl. 464—145 **9 Claims**



1. A universal joint assembly for transmitting a moment of rotation in both directions between two members comprising an outer joint element, an inner joint element, said elements having confronting surfaces, a plurality of rolling elements in

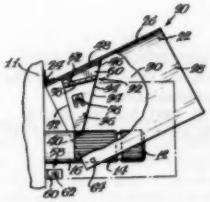
the annular space between the confronting surfaces, one of said surfaces being smooth and the other surface having a series of generally axially extending circumferentially spaced grooves forming raceways for the rolling elements and having flanks at each side of the raceway which open at an angle and at least a pair of rolling elements in each raceway, elastic preload means disposed between the rolling elements of each pair in each raceway operable to contact and separate the rolling elements of each pair thereby to preload the rolling elements away from one another and to press the rolling elements reciprocally in a peripheral direction against the related flank of the raceway groove and said one smooth surface.

4,432,742

PIO MASTER SHIELD

Wayne E. Hartman, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 7, 1981, Ser. No. 328,128
Int. Cl.³ F16D *3/84*
U.S. Cl. 464—176 **4 Claims**



1. A PTO shield assembly for a tractor having a PTO shaft protruding a short distance from a wall of the tractor, said shield assembly comprising: an inverted, U-shaped shield member extending above and to the side of the PTO shaft and secured to said wall of the tractor for pivotation about a substantially horizontal axis perpendicular to the axis of the PTO shaft, said shield member having a lowered position and a raised position; and a link member pivotally secured to a top portion of said shield member and extending downwardly therefrom for selective support of said shield member in its raised position, said link member having a first position wherein said shield member is supported in its raised position and a second position wherein said shield member is in its lowered position, said link member when in said first position being in contact with said PTO shaft and when in said second position being spaced from said PTO shaft, biasing means for normally biasing said link member into its second position, said biasing means extends between said link member and said shield member, and means for automatically moving said shield member from its raised position to its lowered position upon rotation of said PTO shaft.

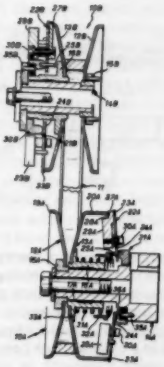
4,432,743

VARIABLE SPEED DRIVE PULLEY

Didier Pitoiset, Montmorency, France, assignor to Valeo, Paris, France

Filed Oct. 5, 1981, Ser. No. 308,461
Claims priority, application France, Oct. 9, 1980, 80 21571
Int. Cl.³ F16H *55/56*
U.S. Cl. 474—14 **20 Claims**

1. A variable speed drive pulley comprising a fixed pulley half and a movable pulley half facing each other and fixed for rotation with a rotatable shaft, said fixed pulley half being axially connected in operation to said rotatable shaft, said movable pulley half being mounted for axial movement relative to said rotatable shaft, at least part of a side of one of said pulley halves being frustoconical, an annular abutment member fixed for rotation with and bearing axially against said rotatable shaft, resilient return means comprising a diaphragm spring bearing axially against said annular abutment member and urging said movable pulley half in the direction of said fixed pulley half, said annular abutment member comprising a bearing component and a contact component bearing axially against each other, said bearing component being fixed axially relative to said rotatable shaft, said diaphragm spring being



fulcrumed on said contact component, said diaphragm spring being fixed axially and circumferentially relative to said contact component, the improvement comprising means floatingly mounting said contact component with respect to said bearing component for permitting limited shifting movement with said diaphragm spring transversely relative to the axis of said rotatable shaft.

4,432,744

POWER TRANSMISSION BELT

Junji Imamura, Kobe, and Kaname Matsumura, Akashi, both of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Sep. 28, 1981, Ser. No. 306,403
Claims priority, application Japan, Sep. 26, 1980, 55-138014
Int. Cl.³ F16G *5/00*
U.S. Cl. 474—238 **32 Claims**

17. In a power transmission belt having an inner compression section, an outer tension section, and longitudinal tensile cords, the improvement comprising

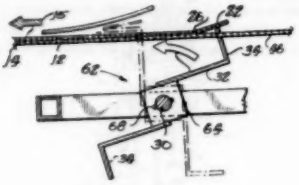
at least one layer of low thermal contraction fabric forming an inner portion of the compression section, said fabric being comprised of yarns formed of a mixture of natural and synthetic fibers in the ratio of approximately 30% to 70%, said yarns having a coefficient of thermal contraction of no more than approximately 1%.

4,432,745

TRAILING EDGE FOLDER

Charles W. Eldridge, Beverly, Mass., assignor to Paxall, Inc., Chicago, Ill.

Filed May 6, 1982, Ser. No. 375,574
Int. Cl.³ B31B 1/54
U.S. Cl. 493—10 18 Claims



1. A trailing edge folding accessory apparatus for use in combination with a carton blank folding machine having support means for continuously advancing blanks in a predetermined direction in untimed relationship to one another along a generally horizontal path in said folding machine, the apparatus operating to fold a trailing blank panel 180° about a fold line that extends generally transverse to said advancement path, which apparatus comprises means for sensing the presence of a blank at a location along said path and providing a signal, a rotatable shaft mounted below said path and transverse thereto, drive means to rotate said shaft, clutch means to alternately associate and dissociate said shaft with the movement of said drive means to cause said shaft to be selectively and unidirectionally rotated from said drive means, brake means to stop said rotating shaft in precise positions, an arm having an inner end and an outer end, said arm being mounted on said shaft at said inner end to extend generally radially therefrom, an elongated head at said outer end of said arm which is carried by said rotating shaft from a first dwell position completely below said path to a second position just above and generally parallel to said path extending horizontally downstream from said outer end, programmable control means connected to said sensing means for operating said clutch means to associate said shaft with said drive means to carry said head from said first position to said second position at a certain instant following detection of said blank at said location, said head while moving from said first position to said second position contacting the underside of the trailing panel and folding the trailing panel 180° about the fold line, said control means operating said clutch means to dissociate said shaft from said drive means and to operate said brake means to pause said shaft with said head in said second position allowing the blank to slide out from under said head, and after a predetermined, adjustable pause period that is programmed into said control means again associating said shaft with said drive means to further rotate same and remove said head to below the said path.

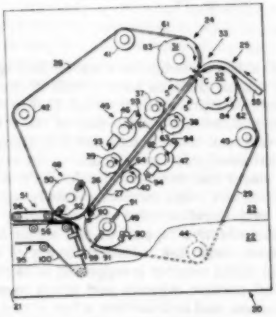
10. A trailing edge folding accessory apparatus for use in combination with a carton blank folding machine having support means for continuously advancing blanks in a predetermined direction in untimed relationship to one another along a generally horizontal path in said folding machine, the apparatus operating to fold a trailing blank panel 180° about a fold line that extends generally transverse to said advancement path, which apparatus comprises means for sensing the presence of a blank at a location along said path and providing a signal, means for continuously measuring incremental advance of said support means and providing a signal, a rotatable shaft mounted below said path and transverse thereto, means for intermittently rotating and stopping said shaft, an arm having an inner end and an outer end, said arm being mounted on said shaft at said inner end to extend radially therefrom, an elongated head at said outer end of said arm which is carried by said rotating shaft from a first dwell position completely below the path to a second position just above and generally parallel to said path extending horizontally downstream from said outer end, programmable control means connected to said sensing means and said measuring means for operating said shaft-rotating means, said control means operating said shaft-rotating means to carry said head from said first position to said second position following detection of said blank at said location and after a predetermined measured increment of advance of said support means, said head moving from said first position to said second position contacting the underside of the trailing panel and folding the trailing panel 180° about the fold line, said control means operating said shaft rotating means to stop said shaft to cause said head to pause for an adjustable period in said second position allowing the blank to slide out from under said head, and after a predetermined measured increment of advance of said support means, said control means again operating said shaft-rotating means to carry said head to below said path.

4,432,746

WEB SEGMENTING APPARATUS

Dennis A. DeHaan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 21, 1981, Ser. No. 265,738
Int. Cl.³ B65H 45/16, 17/34; B23Q 7/00
U.S. Cl. 493—359 9 Claims

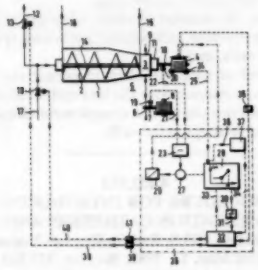


1. Apparatus for segmenting a web into discrete articles which apparatus comprises a frame, a positive web translation means for receiving and forwarding a web in a predetermined and substantially uniform state of longitudinal stress, and cutting means operatively associated with said translation means to segment said web downstream from an infeed end of said translation means into a stream of discrete articles having substantially uniform machine direction lengths, said translation means comprising a first endless conveyor and a second endless conveyor having runs in parallel opposed relation, said first endless conveyor comprising a flight of web engaging friction plates which are longitudinally spaced to define cutter access openings between adjacent pairs of said plates, and a rotatably mounted and powered infeed roll having one or more radially outwardly projecting lugs which lugs are configured and disposed to extend into and substantially fill each of said cutter access openings of said flight to engage said web as said infeed roll rotates and said flight is driven over a circumferential portion of said infeed roll, said friction plates and said infeed roll being complimentarily configured to corporately define one half of a constant clearance infeed nip disposed at said infeed end of said translation means, said cutter access openings constituting means for said cutter means to effect said segmenting.

4,432,747
CENTRIFUGAL SEPARATOR CONTROL

Günther Posse, Bergisch Gladbach, and Horst Jacob, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,413
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115692
Int. Cl.³ B04B 9/02
U.S. Cl. 494—8 14 Claims

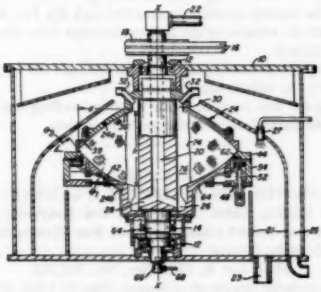


1. A method for controlling the differential speed between the relatively rotating centrifugal drum and the screw conveyor of a centrifugal separator comprising the steps:
measuring the driving torque of the screw;
measuring the speed of the drum and of the screw and obtaining a value of speed differential;
operating the drum and screw at a speed differential which constantly varies with variation in torque as a predetermined functional relationship to said torque;
making step by step changes in said relationship to obtain a relationship other than said first relationship at predetermined upward change or downward change of the values of the torque.

4,432,748
CENTRIFUGE APPARATUS AND METHOD OF OPERATING A CENTRIFUGE

John Novoselac, and Dale L. Churcher, both of Cambridge, Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 720,200, Sep. 3, 1976. This application May 15, 1978, Ser. No. 905,695
Int. Cl.³ B04B 1/16
U.S. Cl. 494—2 26 Claims

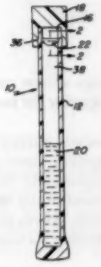


1. The method of separating a slurry of solid particles entrained in a fluid vehicle into an effluent component primarily consisting of the fluid vehicle and a relatively heavier centrifuged product component primarily consisting of a mass of the particles within a centrifuge including an elongated shaft member rotatable about the central longitudinal axis thereof and a pair of formed bowl members defining a centrifuge chamber carried by such shaft member for rotation therewith and which bowl members have a peripheral portion spaced radially outermost from said central axis selectively capable of preventing or permitting the flow of the centrifuged product component therethrough; comprising: separating portions of such a slurry, continuously admitted throughout an initial period of time interiorly of such bowl members with said peripheral portion preventing the flow of the centrifuged product component therethrough during continuous rotation of such bowl members, into such a product component which increases in radial extent with respect to said axis throughout said initial period until a mass thereof extends from the interior of such peripheral portion to radially outwardly adjacent such shaft with the portion of said mass adjacent said shaft defining an elongated unobstructed passageway axially encompassing the full extent of such shaft within said bowl members and with said passageway having a lateral extent substantially less than the maximum radial extent of said mass and into such an effluent component while discharging portions of such effluent component exteriorly of such bowl members from one axial end of said passageway; discharging portions of said mass through said peripheral portion over an immediately subsequent period of time while maintaining the rotation of said bowl members while simultaneously separating additional portions of such slurry admitted on a continuous basis to the interior of the bowl members into such product component and such effluent component at a rate that increments of said product component are added to said mass to maintain the radial extent of said mass substantially uniform throughout said subsequent period of time; and simultaneously throughout said subsequent period of time continuously discharging portions of such effluent component of said additional portions of such slurry from said one axial end of said passageway.

4,432,749
SELF-CONTAINED SWAB UNIT

Thomas A. Snyder, Willow Grove, and Walter T. Leible, Warminster, both of Pa., assignors to Hillwood Corporation, Warminster, Pa.

Continuation-in-part of Ser. No. 135,412, Mar. 31, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 360,038
Int. Cl.³ A61M 35/00
U.S. Cl. 604—2 5 Claims



1. A disposable swab unit comprising:
(a) a generally hollow container adapted to be squeezed, said container having a wall, a closed end and an open end capped by a structure providing a swabbing means;
(b) a liquid medium within the hollow container;
(c) a plug having a body, the bottom of said body juxtaposed to said liquid medium and the top of said body juxtaposed to said swabbing means, the top of said body having a

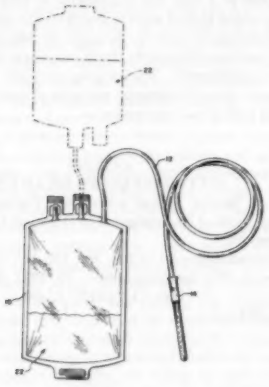
diameter larger than the inner diameter of the container, said body being tapered inwardly from the top of said body towards the bottom of said body, said body having an annular chamber disposed within the top surface thereof radially inwardly from said taper to facilitate inward deformation of said tapered surface, the plug inserted within said container to form a sealed compartment for holding the liquid medium in the portion of said container between the closed end and the plug said plug being pivotable relative to the container wall so as to allow said liquid medium to flow past said plug to contact said swabbing means upon squeezing of said container.

4,432,750

ADDITIVE STEROL SOLUTION AND METHOD FOR PRESERVING NORMAL RED CELL MORPHOLOGY IN WHOLE BLOOD DURING STORAGE

Timothy N. Estep, Lindenhurst, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,772
Int. Cl.³ A61M *1/03*; A61K *35/14*; A01N *1/00*
U.S. Cl. 604—4 18 Claims



7. A whole blood storage system comprising
a container having an interior for receiving whole blood for storage,
a solution carried within said interior and including a physiologically blood compatible sterol present in a concentration of between approximately 1.0 and 3.0 milligrams per milliliter of whole blood stored within said container.

11. A whole blood storage system according to claim 7 or 8 wherein said solution further includes, as a part thereof, an anticoagulant.

12. A whole blood storage system according to claim 11 wherein said solution further includes, as a part thereof, a nutrient for the whole blood.

13. A whole blood storage system according to claim 12 wherein said container includes
a donor tube having an end attached in flow communication with said interior and an opposite end, and
a phlebotomy needle attached in flow communication with said opposite end.

4,432,751

MONOCLONAL ANTIBODIES AGAINST LENS EPITHELIAL CELLS AND PREVENTING PROLIFERATION OF REMNANT LENS EPITHELIAL CELLS AFTER EXTRACAPSULAR EXTRACTION

Jared M. Emery, and Dominic M. Lam, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Mar. 5, 1982, Ser. No. 355,081
Int. Cl.³ A61B *19/00*
U.S. Cl. 604—49 3 Claims

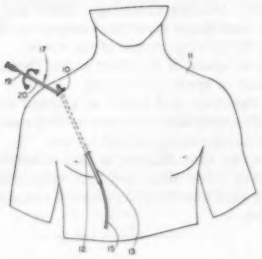
1. A method of preventing lens epithelial cell growth after extracapsular extraction comprising,
instilling into the anterior chamber of an eye after the extracapsular extraction monoclonal antibodies specific to lens epithelial cells, and
after a period of time sufficient to permit the monoclonal antibodies to interact with the lens epithelial cells instilling into the anterior chamber a complement effective to cause lysis to the lens epithelial cells.

4,432,752

PROCEDURE FOR INTRODUCING HYPERALIMENTATION CATHETERS AND THE LIKE

Anthony M. Marlon, 888 S. Rancho Dr., Las Vegas, Nev. 89106

Filed Mar. 12, 1982, Ser. No. 357,835
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—53 23 Claims



1. A method for the insertion of an indwelling catheter into the subclavian vein of a patient which comprises the steps of:
a. making a first incision in the subclavian area of the patient;
b. making a second incision in the patient at a location displaced from the first incision;
c. making subcutaneous tunnel from the second incision to the first incision, said making of the tunnel comprising moving a hollow catheter into the second incision and subcutaneously to and through the first incision;
d. moving the indwelling catheter through the hollow catheter from the second incision to and through the first incision;
e. after step d., removing the hollow catheter from the subcutaneous tunnel;
f. inserting the indwelling catheter in through the first incision and into the subclavian vein; and
g. closing the first incision to have the indwelling catheter exit from the patient only at the second incision.

4,432,753

APPARATUS FOR ARTIFICIAL INSEMINATION

Bertrand Cassou, Saint Symphorien des Bruyeres; Maurice Cassou, and Robert Cassou, both of Rue Clemenceau, all of 61300 L'Aigle, France

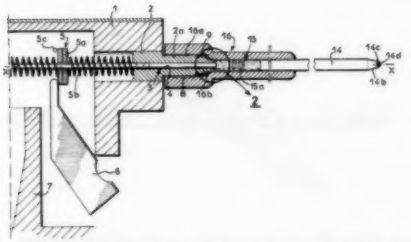
Filed Jun. 8, 1982, Ser. No. 386,355
Claims priority, application France, Dec. 3, 1981, 81 22628
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—55 10 Claims

1. A multi-shot artificial insemination apparatus comprising:
a body presenting a snout and a passage through said snout;

a disposable reservoir means for containing plural doses of liquid semen and comprising a tube having a rear end;

said snout and said tube rear end being cooperatively configured to fit said rear end to said snout in alignment with said passage;

said tube further comprising a blunt convergent front end and a length from said rear end to said front end and freely



protruding sufficiently far from said snout for insertion of said tube into an animals cloaca to facilitate said insemination;

a plunger extensible through said passage and into said tube rear end; and

means for displacing said plunger stepwise to discharge successive doses of said liquid semen from said tube through said front end to said cloaca.

4,432,754

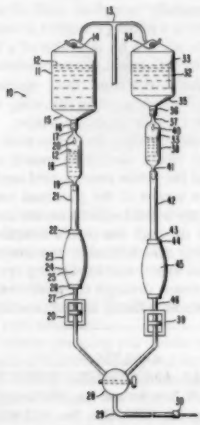
APPARATUS FOR PARENTERAL INFUSION OF FLUID CONTAINING BENEFICIAL AGENT

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed May 24, 1982, Ser. No. 381,402

Int. Cl.³ A61M *5/16*

U.S. Cl. 604—56 **28 Claims**



1. A parenteral delivery system for administering a beneficial agent formulation to an animal, the system comprising:

(a) a primary reservoir of a pharmaceutically acceptable fluid;

(b) a primary path in communication with the reservoir for the flow of a parenterally acceptable fluid therethrough;

(c) a formulation chamber in the primary path, the formulation chamber comprising:

(1) a wall surrounding a lumen;

(2) an inlet for letting fluid from the primary path into the formulation chamber;

(3) a beneficial agent in the formulation chamber that forms an agent formulation with fluid that enters the formulation chamber;

(4) an agent release means including a permeable film means within the formulation chamber that aids in controlling the rate of release of beneficial agent formulation from the formulation chamber; and,

(5) an outlet for letting an agent formulation leave the formulation chamber;

(d) a secondary reservoir of a pharmaceutically fluid;

(e) a secondary path in communication with the reservoir for the flow of a parenterally acceptable fluid therethrough;

(f) a formulation chamber in the secondary path, the formulation chamber comprising:

(1) a wall surrounding a lumen;

(2) an inlet for letting fluid from the secondary path into the formulation chamber;

(3) a beneficial agent in the formulation chamber that forms an agent formulation with fluid that enters the formulation chamber;

(4) an agent release means including a permeable film means within the formulation chamber that aids in controlling the rate of release of beneficial agent formulation from the formulation chamber; and,

(5) an outlet for letting an agent formulation leave the formulation chamber; and,

(g) a common path in communication with the primary path and in communication with the secondary path for receiving agent formulation, which common path, when the parenteral system is in use, is in communication with the animal for administering beneficial agent formulation thereto.

4,432,755

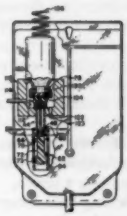
STERILE COUPLING

Stephen Pearson, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 365,943, Apr. 6, 1982. This application May 25, 1983, Ser. No. 497,963

Int. Cl.³ A61M *5/00*; A61J *1/00*

U.S. Cl. 604—56 **4 Claims**



3. A method for selectively establishing a sterile pathway between the access means of each of two separate receptacles, each access means having an end portion, wherein one of the access means includes a piercing element, the steps comprising:

(a) maintaining the end portions in predetermined, spaced relation;

(b) injection molding material about at least the end portions of both access means;

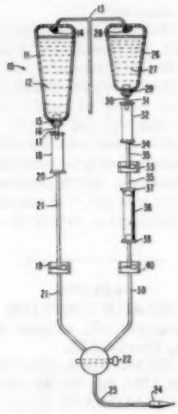
(c) simultaneously sterilizing the end portions of both access means by heat transfer from the injection molded molten material;

(d) cooling the molten material into a unitary junction means enclosing the end portions, the junction means maintaining the end portions in sterile relation; and

(e) selectively urging the piercing element through the junc-

tion means and the other of the access means thereby establishing a sterile pathway through both access means.

4,432,756
PARENTERAL CONTROLLED THERAPY
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed Nov. 27, 1981, Ser. No. 325,206
Int. Cl.³ A61M 5/00
U.S. Cl. 604—80 **42 Claims**



1. A parenteral delivery set for administering a beneficial fluid and a beneficial agent formulation to an animal, the set comprising:

(a) a primary tube for the flow of a parenterally acceptable fluid therethrough;

(b) a secondary tube for the flow of a parenterally acceptable fluid therethrough;

(c) a formulation chamber in communication with the secondary tube, the formulation chamber comprising:

(1) a wall surrounding a lumen;

(2) an inlet for letting fluid from the secondary tube into the formulation chamber;

(3) a beneficial agent in the formulation chamber that forms an agent formulation with fluid that enters the formulation chamber;

(4) a release rate controlling membrane in the formulation chamber, said membrane formed of a polymeric material that governs the rate of release of agent formulation from the formulation chamber;

(5) an outlet for letting an agent formulation leave the formulation chamber; and,

(d) a common tube in communication with the primary tube for receiving fluid from the primary tube, and in communication with the secondary tube for receiving agent formulation from the secondary tube, which common tube, when the set is in use is in communication with the animal, administers the beneficial fluid and the beneficial agent formulation thereto.

4,432,757
INDWELLING URETHRAL CATHETER
Richard C. Davis, Jr., 5828 - C Westower Dr., Richmond, Va. 23225
Division of Ser. No. 148,340, May 9, 1980, Pat. No. 4,350,161.
This application Apr. 9, 1982, Ser. No. 366,963
Int. Cl.³ A61M 25/00
U.S. Cl. 604—99 **5 Claims**

1. An indwelling urethral catheter comprising:

a catheter drainage shaft means defining an enclosed drainage canal, for extending through most of a urethra to provide urinal drainage and having distal and proximal ends;

said catheter drainage shaft means including an anchoring means for extending a substantial distance along said enclosed drainage canal for anchoring and holding said shaft in position in said urethra while not inhibiting said drainage canal from providing urinal drainage therethrough and for filling potential spaces which could serve as a nidus of inflamation along said urethra, said anchoring means having a substantially compliant wall for defining an inflation lumen which is separate from, but parallel to, said enclosed drainage canal along said drainage shaft means where said drainage shaft means is positioned in said urethra, downstream of the prostatic urethra;

wherein said substantially compliant wall of said anchoring means is inflatable in a patient's urethra downstream of the patient's prostatic urethra by insertion of a fluid into said inflation lumen to fill spaces in the urethra and thereby anchor said catheter drainage shaft against retrograde movement in said urethra while allowing said enclosed drainage canal to provide urinal drainage;

and wherein said catheter being for use in male patients with the proximal end of the anchoring means not extending beyond the end of the penile meatus, said anchoring means including a valve means at the proximal end thereof for being held open by a fluid source means extending from outside the penis through the penile meatus to the valve means for allowing said inflatable member to be inflated by the fluid source means and for closing upon removal of the fluid source means through the penile meatus to leave said anchoring means inflated in said urethra.

4,432,758
URETHRAL ANESTHETIC DEVICES
Aaron N. Finegold, 136 Beechwood La., Pittsburgh, Pa. 15206
Filed Aug. 30, 1982, Ser. No. 412,985
Int. Cl.³ A61M 25/00
U.S. Cl. 604—104 **7 Claims**

1. A urethral anesthetic application instrument comprising:

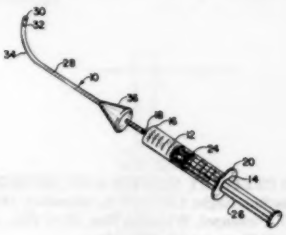
(a) a hollow syringe body including a first end which is open to the atmosphere and a second end which terminates in a coupler in fluid communication with the interior of said syringe body;

(b) a slidable plunger assembly disposed within said syringe body and extending through said first end;

(c) an elongated hollow barrel mounted to said coupler, said

barrel including a passageway in fluid communication with said coupler and one or more openings adjacent the end of said barrel opposite said coupler and in communication with said passageway, said barrel formed in the shape of a Van Buren curve; and

(d) a meatal obstructor slidably mounted around said barrel,

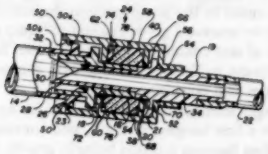


whereby said barrel may be inserted into the entire length of a patient's urethra and then said barrel may be withdrawn while simultaneously applying an anesthetic to the urethra through said openings, and wherein said obstructor may be positioned against the external orifice of the urethra while said barrel is withdrawn, thereby preventing said anesthetic from escaping from the urethra.

4,432,759
CONNECTING DEVICE FOR MEDICAL LIQUID CONTAINERS

James R. Gross, Bartlett, and Albert F. Bujan, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 26, 1982, Ser. No. 371,643
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—411 **5 Claims**



1. A connection assembly comprising:

a medical liquid container;

a tubular port member extending from the container, said tubular port member including a flange member disposed about its distal end;

a pierceable diaphragm positioned within and sealing said tubular port member;

a hollow tubular piercing pin connected at its proximal end to a length of flexible tubing and having a sharpened tip at its distal end adapted for penetration of said pierceable diaphragm member;

locking means for the selective retention of said piercing pin within said tubular port member;

said locking means comprising a clasp member including first and second substantially C-shaped body portions hingedly connected to each other and further including latching means at opposing sides thereof, said clasp member being constructed and arranged for telescopic attachment to said tubular port;

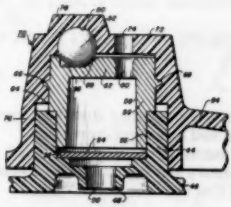
a plurality of protru...ing frictional engagement means integrally formed and disposed within said clasp member proximate the distal end thereof, said protruding frictional engagement means being constructed and arranged for securing said clasp member on said port following said telescopic attachment; and

additional engagement means defined by a flange member extending from said piercing pin and a wall surface positioned within said clasp member to limit longitudinal movement of said piercing pin in their direction.

4,432,760
ADMINISTRATION SET INCLUDING BURETTE WITH PIVOTABLE AIR VALVE

Herbert Mittleman, Deerfield, and Gordon P. Boland, Zurich, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 170,399, Jul. 21, 1980, Pat. No. 4,332,247, which is a continuation of Ser. No. 938,063, Aug. 30, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 350,680
Int. Cl.³ A61M *5/14*
U.S. Cl. 604—246 **7 Claims**



1. In a medical device having a chamber, an air valve comprising a stationary port extending from a wall of said chamber and defining a bore therethrough, said port including a fitting shaped to define an open internal portion, a top portion of said fitting shaped to define a passageway, said fitting closing said port except for said passageway, with said passageway being substantially smaller than the open internal portion, a filter member located transverse said bore and directly underlying said passageway, a pivotable closure overlying the port and being pivotally connected therewith, said pivotable closure shaped to define an opening for communication with said passageway when the closure is pivoted to a predetermined open position, and means for segregating said closure opening from said passageway when said closure is in its closed position, said segregating means comprising a resilient member movable with the pivoting movement of said closure to close and seal said passageway when the closure is not in said predetermined open position, said fitting being proportioned to compress the resilient member while it is closing and sealing said passageway.

4,432,761
VOLUMETRIC DROP DETECTOR

Garfield A. Dawe, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 276,119, Jun. 22, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,369
Int. Cl.³ A61M *5/00*; G01F *1/00*
U.S. Cl. 604—253 **19 Claims**

1. A volumetric measuring device for use with a liquid conveying apparatus including the usual first and second flow paths comprising:

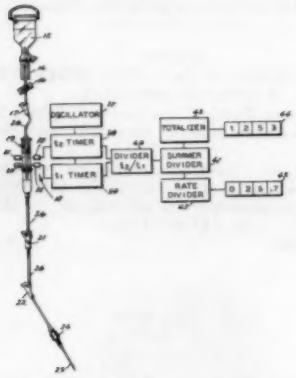
liquid drop forming means;

a length of measurement tubing having a known internal diameter;

means operatively associated with said drop forming means to direct liquid drops into said measurement tubing to form a liquid column;

first and second liquid sensor means operatively positioned with respect to said measurement tubing;

electronic means operatively associated with said first and second liquid sensor means to measure the velocity and length of said liquid column;



collecting means positioned from said measurement tubing to receive said measured drops; and

connector means operatively associated with said drop forming means and said collecting means for connection with said first and second flow paths.

4,432,762

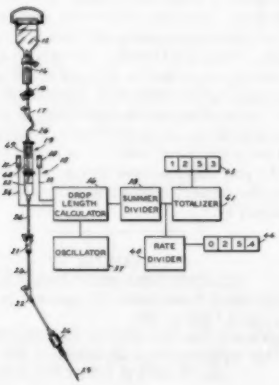
VOLUMETRIC DROP DETECTOR

Garfield A. Dawe, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 276,120, Jun. 22, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,370

Int. Cl.³ A61M *5/16*

U.S. Cl. 604—253 **17 Claims**



1. A volumetric drop detector for use with a liquid conveying apparatus including the usual first and second flow paths comprising:

liquid drop forming means;

a length of measurement tubing having a known internal diameter;

means operatively associated with said drop forming means to direct liquid drops into measurement tubing;

optoelectronic means operatively positioned with respect to said measurement tubing to determine the length of said drop;

collecting means positioned from said measurement tubing to receive said measured drops; and

connector means operatively associated with said drop forming means and said collecting means for connection with said first and second flow paths.

4,432,763

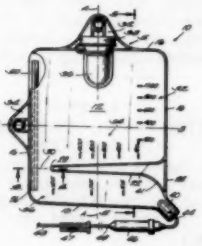
FLUID DELIVERY SYSTEM AND METHOD

James G. Manschot, Eagle; Lawrence A. Salvadori, Milwaukee, and David D. Plekenpol, Whitefish Bay, all of Wis., assignors to The Kendall Company, Boston, Mass.

Filed May 10, 1982, Ser. No. 376,382

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—262 **24 Claims**



1. A liquid delivery system comprising:

a container having a filling inlet in the upper portion thereof and an outlet in the lower portion thereof, said filling inlet adapted to receive a given amount of liquid poured into the interior of said container, said liquid outlet having a control valve means in fluid communication therewith to control flow from said container outlet;

a first hanger member on said container for hanging said container in a first hanging position, said container outlet when in said first hanging position being in gravity flow communication with the entire given amount of liquid in said container so that when said control valve means is opened, the entire given amount of fluid in said container will flow out of the container;

a second hanger member on said container for hanging said container in a second hanging position, said container outlet when in said second hanging position being in gravity flow communication with a portion of the entire given amount of fluid in said container so that when said control valve means is opened, only said portion of the entire given amount of fluid in said container will flow out of the container;

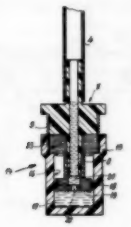
said interior of said container when in said second hanging position is divided into two separate chambers wherein a portion of said given amount of liquid will be contained in one of said chambers and a portion of said given amount of liquid will be contained in the other of said chambers, said two chambers when in said second hanging position having no gravity flow communication therebetween; and

said two separate chambers when in said second hanging position are separated by a barrier means which extends from one edge of said container to a point spaced from the opposite edge of said container.

4,432,764
ANTISEPTIC END CAP FOR CATHETER

Georges Lopez, Lyons, France, assignor to Societe de Materials Annexed de Dialyse S.M.A.D., France

Filed Nov. 4, 1981, Ser. No. 318,271
Claims priority, application France, Nov. 5, 1980, 80 23950
Int. Cl.³ A61M 25/00
U.S. Cl. 604—283 10 Claims

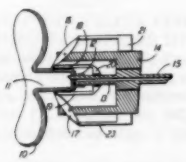


1. In combination with a catheter having a tube end provided with an end fitting, an antisepticizing device comprising:
a cap having a formation of a shape complementary to that of said end fitting and connectable thereto, said cap being formed with a passage having one end communicating with said end fitting and therethrough with said catheter when said end fitting is fitted to said formation;
a reservoir in said cap having a movable wall, the other end of said passage opening into said reservoir;
a body of an antiseptic liquid in said reservoir; and
means automatically effective upon the mounting of the cap on said end fitting for displacing said movable wall of said reservoir and thereby forcing said liquid through said passage into said catheter fitted to said formation.

4,432,765
ATTACHMENT DEVICE FOR MEDICAL FLUIDS BAG

Rolf A. Oscarsson, 10 Gemini Cir., Andover, Mass. 01810

Filed Jul. 14, 1982, Ser. No. 398,287
Int. Cl.³ A61M 5/00
U.S. Cl. 604—411 8 Claims

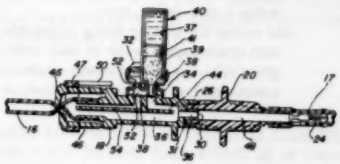


6. A connector for a fluid container having a neck of predetermined diameter ending in a penetrable end wall, comprising:
a. a base member;
b. a hollow spike member positioned on said base member and adapted to penetrate the end of said neck as said neck is moved towards said hollow spike member;
c. at least one toggle member adjacent the path of travel of said neck and pivotable inwardly on said base member so that the end of said toggle member moves from a open position away from said spike member to a closed position near said spike member, the end of said toggle member pinching said neck at an intermediate point of arcuate travel and said end of said toggle member pushing said neck at said intermediate point of travel and forcing said neck toward said hollow spike member as said toggle member moves to the closed position thereof;
d. guide means on said base member for directing said neck along its longitudinal axis over said base member, part of said guide means being spaced apart a distance less than said diameter at said intermediate point of acruate travel and including means to retain said neck against lateral motion;
e. a leg member articulately attached at one end thereof to said end of said toggle member, dependent therefrom and extending towards said hollow spike member and an engagement means at the end of said leg member adapted to engage the end of said neck when said neck is seated in the connector and said toggle member is moved from said closed position to the open position thereof; and
f. a hand operated means for effecting motion of said toggle member from said closed position to said open position.

4,432,766
CONDUIT CONNECTORS HAVING ANTISEPTIC APPLICATION MEANS

Marc Bellotti, Winnetka; Dean G. Laurin, Lake Zurich; Ronald C. Stauber, Hawthorn Woods, and Larry C. Taylor, McHenry, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 29, 1981, Ser. No. 288,224
Int. Cl.³ A61M 3/00
U.S. Cl. 604—283 17 Claims



1. In a connector member having a lumen carried on the end of a first conduit for sealingly connecting with the lumen of another connector member carried on the end of another conduit, the improvement comprising:
first aperture means communicating between the exterior and the interior of said connector member, bacteria-blocking, hydrophobic filter means positioned in said first aperture means, a source of antiseptic in flow communication with said first aperture means, said source of antiseptic being capable of passing an antiseptic through said filter means, and closure means for releasably sealing the interior of said first conduit without disrupting said sealing connection with the other connector member.

4,432,767
TUBING INJECTION SITE GUARD

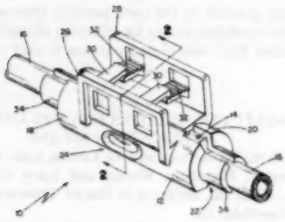
Donn D. Lobdell, Golden, and Thomas E. Goyne, Denver, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Nov. 16, 1977, Ser. No. 852,058
Int. Cl.³ A61M 5/00, 5/03
U.S. Cl. 604—86 8 Claims

1. A tubing injection site guard comprising:
a compressible, penetrable sleeve adapted to surround a continuous tube,
a longitudinally divided rigid casing comprising
two casing sections,
one of said casing sections having a needle access port, said casing sections having walls, said wall of one said casing section being spaced-apart from the other said wall,
a longitudinal hinge joining said casing sections along one longitudinal side, and
means for locking said casing sections together around said sleeve in an adjustable relationship therebetween,

said needle access port allowing a needle to be inserted through said needle port and said sleeve into said tubing,

said casing radially compressing said sleeve throughout the length of said sleeve when said locking means is actuated, thereby sealing said sleeve against said tube



throughout said sleeve length and sealing needle holes in said sleeve, and

said means for locking being adjustable so as to draw said spaced-apart walls of said casing sections progressively together thereby increasing the radial compression of said casing sections on said sleeve.

4,432,768

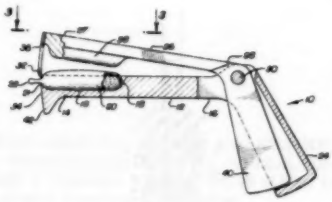
MEDICINAL FLUID APPLICATOR

Jack B. Brown, Granada Hills, Calif., and Wijnand J. Bischoff, Olds, Canada, assignors to Banner Gelatin Products Corp., Chatsworth, Calif.

Filed Sep. 17, 1982, Ser. No. 419,229

Int. Cl.³ A61M 5/00

U.S. Cl. 604—200 5 Claims



1. A medicinal fluid applicator for discharging fluid from a compressible fluid-filled capsule, comprising:

a frame for holding said capsule;

a pressure arm hingedly connected to said frame for movement toward said capsule when held by said frame to apply pressure thereto; and

a blade depending from said pressure arm for severing said capsule upon movement of said arm toward said capsule held by said frame to permit said fluid to be discharged therefrom by pressure from said arm.

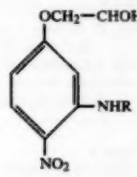
4,432,769

NITRO DYESTUFFS, A PROCESS FOR THEIR PREPARATION, AND USE OF THESE DYESTUFFS IN DYEING KERATIN FIBRES

Andree Bugaut, Boulogne-Billancourt, and Patrick Andrillon, Chelles, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 7, 1981, Ser. No. 291,098
Claims priority, application France, Aug. 8, 1980, 80 17617
Int. Cl.³ A61K 7/13; C07C 89/00, 91/06, 93/14
U.S. Cl. 8—414 35 Claims

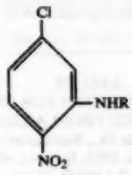
1. A compound having the formula:



(I)

in which R denotes hydrogen, a lower alkyl, lower hydroxyalkyl or lower polyhydroxyalkyl radical.

9. Process for the preparation of a compound as defined in claim 1, which comprises reacting 3-amino-4-nitro-chlorobenzene or a derivative thereof, of the formula:



(II)

in which R is as defined in claim 1, with glycerol, in the presence of sodium hydroxide, at a temperature of 100° to 150° C.

10. A composition suitable for dyeing human hair which comprises an aqueous, alcoholic or aqueous-alcoholic vehicle and an effective amount of at least one compound as defined in claim 1.

4,432,770

RAPID DYEING OF POLYESTER FIBERS WITH A MIXTURE OF DISPERSE DYES

Rolf Hasler, Oberwil; Beat Henzi, Basel; Ernst Schnider, Füllinsdorf, and Hermann Ulshoefer, Ettingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Nov. 17, 1982, Ser. No. 442,366
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146178
Int. Cl.³ C09B 67/22; D06P 3/54
U.S. Cl. 8—638 20 Claims

1. A method of rapid dyeing a substrate comprising polyester fibers comprising bringing into contact with the substrate an aqueous dyebath at a temperature above 100° C. and containing a mixture of at least two disperse dyes, said mixture consisting of disperse dyes having each individually

(i) a degree of absorption A ≧ 90% after 5 minutes at 130° C. and ≧ 95% after 20 minutes of 130° C. for a standard dyeing depth of 4×1/1, the starting dyeing temperature being 70° C. and the heating rate 3° C./minute,

(ii) a diffusion coefficient D at 130° C. $\geq 1.6.10^{-10}$ $cm^2.sec^{-1}$,

(iii) a ratio $C.^{\circ}/RTT \geq 14$ wherein C.° is the saturation concentration in mg dye per g substrate and RTT is the dye concentration in mg per g substrate required for the standard dyeing depth 1/1, and

(iv) a kinetic parameter $Z \geq 1.6.10^{-4}$ wherein $Z = k.C.^{\circ}/RTT\sqrt{D}$ wherein k = 1 cm^{-1} $sec^{\frac{1}{2}}$.

4,432,771

COMBUSTIBLE COAL/WATER MIXTURES FOR FUELS AND METHODS OF PREPARING THE SAME

Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 15, 1981, Ser. No. 263,810
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 16 Claims

1. A combustible fuel slurry comprising:

from 65–70% coal powder in particulate form and having a rounded particle shape;

from 0.5 to 5% by weight of a wetting/dispersing agent selected to be low to nonfoaming in water and having a structure that consists of an organic portion that absorbs on the surface of said coal particles with said agent having a charged hydrophilic portion that is lyophilic to the continuous water phase;

a clay stabilizing composition in the form of a predispersion comprising a clay stabilizer, a clay dispersant and water wherein the amount of clay stabilizer in the fuel slurry is from 0.15 to 0.8% by weight; and

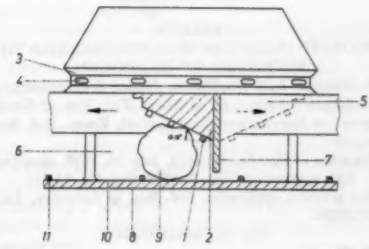
the remainder of said fuel being water, whereby the clay stabilizer, when added to the fuel slurry, provides a stabilizing gel structure for the slurry.

4,432,772

SLAG BREAKER OF PRESSURE-TYPE COAL GASIFIER

Joachim Starke; Adolf Jakubik; Erich Girodi, all of Hoyerswerda; Manfred Strüdinger, and Reinhard Exner, both of Cottbus, all of German Democratic Rep., assignors to Veb Gaskombinat Schwarze Pumpe, Schwarze Pumpe, German Democratic Rep.

Filed Apr. 23, 1982, Ser. No. 371,183
Claims priority, application Austria, Apr. 11, 1981, 4730/81; German Democratic Rep., May 22, 1981, 230178; Japan, Nov. 26, 1981, 56-188498
Int. Cl.³ C10J 3/72
U.S. Cl. 48—66 13 Claims



1. A slag breaker of a pressure-type coal gasifier having a rotary grate with a plurality of grate segments rotatable therewith, a generator bottom, and an ash separator, the slag breaker comprising an inclined breaking plate arranged to jointly rotate with and to be located immediately below the grate segments and prior to the ash separator and provided with a plurality of breaking projections; and a wear sheet arranged to be located on the generator bottom and provided with a plurality of breaking webs so as to cooperate with said breaking projections of said breaking plate and to break slag below said rotary grate.

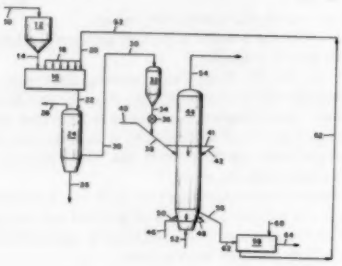
4,432,773
FLUIDIZED BED CATALYTIC COAL GASIFICATION PROCESS

Charles A. Euker, Jr., 15163 Dianna La., Houston, Tex. 77062; Robert D. Wesselhoft, 120 Caldwell; John J. Dunkleman, 3704 Autumn La., both of Baytown, Tex. 77520; Dolores C. Aquino, 15142 McCoan, Webster, Tex. 77598, and Toby R. Gouker, 5413 Rocksprings Dr., LaPorte, Tex. 77571

Continuation of Ser. No. 301,787, Sep. 14, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 475,209

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R **11 Claims**



1. A process for the fluidized bed catalytic gasification of carbonaceous solids which tend to agglomerate and swell at elevated temperatures comprising:

(a) contacting said carbonaceous solids with an aqueous solution containing water-soluble alkali metal gasification catalyst constituents, thereby impregnating said carbonaceous solids with said alkali metal gasification catalyst constituents;

(b) oxidizing said catalyst impregnated carbonaceous solids by contacting said solids with an oxygen-containing gas in an oxidation zone at a temperature below about 250° C. such that dry oxidized catalyst impregnated carbonaceous solids are produced: and

(c) gasifying said dry oxidized catalyst impregnated carbonaceous solids at an elevated pressure and temperature in a fluidized bed gasification zone, wherein the density of the fluidized bed in said gasification zone is maintained at a value above about 160 Kg/M^3 by controlling the oxidizing conditions in said oxidation zone.

4,432,774
ADSORPTION-DESORPTION PROCESS FOR THE RECOVERY OF HYDROGEN

Harald Jüntgen; Karl Knoblauch; Jürgen Reichenberger, and Hans-Jürgen Schröter, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

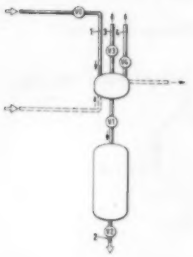
Continuation of Ser. No. 922,422, Jun. 30, 1978, abandoned. This application Nov. 9, 1979, Ser. No. 93,616

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729558

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—25 **8 Claims**

1. In a process for the recovery of a purified gas from a feed gas mixture comprising passing the feed gas through successive interconnected adsorbent containing adsorbers and operating the adsorbers for successive adsorption and desorption, the feed gas containing, in addition to the desired gas, trace pollutants strongly adsorbed in concentrations generally below 1% by volume and components lightly adsorbed in concentrations above 1% by volume, said process employing a preliminary first adsorber for the strongly adsorbable trace pollutants and a main adsorber for the lightly adsorbable components, recovering the purified gas from the main adsorber, effecting the desorption by closing the outlet for the purified gas from the main adsorber and passing the gas through reversal of pressure by pressure reduction or evacuation from the main adsorber to the preliminary adsorber and causing the reversal of pressure jointly in said two adsorbers in the same cycle and subjecting said two adsorbers for the same periods of time to the same adsorption and desorption steps, the desorption gas being discharged exclusively from said preliminary adsorber,



and shutting off said first adsorber from said main adsorber only after a number of several adsorption/desorption cycles, namely when the first adsorber has reached substantially complete contamination by said strongly adsorbable trace pollutants, whereupon said first adsorber is then subjected to a separate regeneration or replacement of the adsorbent.

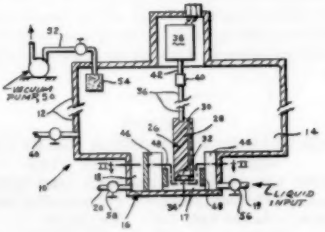
4,432,775
METHOD AND APPARATUS FOR SEPARATING A SUBSTANCE FROM A LIQUID

Vann Y. Won, 6697 Gloria Dr., Sacramento, Calif. 95831

Filed Jul. 30, 1982, Ser. No. 403,280

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—41 **16 Claims**



1. An apparatus for separating a substance from a liquid within which said substance is contained comprising:

a housing, said housing forming a chamber therein;

means operably connected to said housing for creating a vacuum within said chamber;

means situated within said chamber for receiving said liquid therein, and means connected to said liquid receiving means for feeding said liquid to said liquid receiving means at a predetermined rate;

means operably positioned within said liquid receiving means for atomizing said liquid thereby spraying said liquid in mist form into said chamber and vaporizing said substance within said chamber;

said vacuum creating means being capable of withdrawing said vaporized substance, and said liquid receiving means being capable of receiving said atomized liquid; and

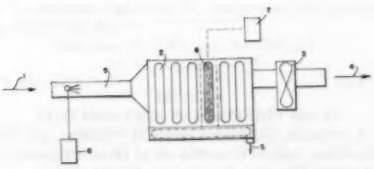
means operably connected to said housing for removing said atomized liquid at a predetermined rate.

13. A method of separating a substance from a liquid within which said substance is contained comprising the steps of:
(a) placing a first container and a second container in a vacuum chamber;
(b) interconnecting said first container to said second container;
(c) feeding said liquid into said first container;
(d) simultaneously atomizing said liquid and creating a vacuum in said chamber in order to draw off said substance being vaporized during atomization of said liquid;
(e) recovering a portion of the atomized liquid in said first container and recovering the remaining portion of said atomized liquid in said second container;
(f) removing a portion of said atomized liquid from said second container; and
(g) feeding the remaining portion of said atomized liquid from said second container into said first container for further atomization thereof.

4,432,776
PROCESS FOR FILTERING SEPARATORS IN DRY CHEMISORPTION

Heinz Holter, Beisenstrasse 39-41, 4390 Gladbeck, Fed. Rep. of Germany; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbuscher, Gladbeck, both of Fed. Rep. of Germany, assignors to Heinz Holter, Gladbeck, Fed. Rep. of Germany

Continuation of Ser. No. 182,737, Aug. 29, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,146
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935464
Int. Cl.³ B01D *53/10*
U.S. Cl. 55—77 2 Claims

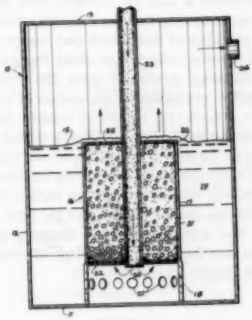


1. A process for cleaning filtering separators used in dry chemisorption systems comprising flowing contaminated gas through an inlet pipe to a reaction stage feeding chemisorption product into the reaction stage through the inlet pipe, reacting the contaminated gas and the chemisorption product in a reaction stage before flowing the contaminated gas and the chemisorption product into the filter system, feeding the contaminated gas and the chemisorption product from the inlet pipe and reaction stage into a stationary horizontally extended filter system having plural vertical filter elements arranged in separate filter pockets and collecting contaminants and chemisorption products below the system, flowing the contaminated gas and chemisorption product into fixed, vertically arranged tissue filters in each of about 100 or more filter pockets, flowing purified gas outward from the tissue filters, the filter pockets, and shielding and cleaning one filter pocket at a time from incoming reacted contaminated gas and chemisorption product and then coating the cleaned filter in the pocket by flowing fresh chemisorption product downward over the one filter in the one pocket removing chemisorption products and contaminants from beneath the filter system and drawing cleaned gas from the filter system through an outlet separate from the inlet pipe with an exhaust fan, wherein the shielding, cleaning and coating steps comprise locating a closed shield over one pocket.

4,432,777
METHOD FOR REMOVING PARTICULATE MATTER FROM A GAS STREAM

Arlin K. Postma, Benton City, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 145,954, May 2, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,411
Int. Cl.³ B01D *47/02, 47/14*
U.S. Cl. 55—86 1 Claim



1. A method of removing particulate matter from a stream of pressurized gas comprising:
(a) providing an open ended container having gas impervious upright side walls,
(b) substantially filling the open ended container with a porous bed,
(c) surrounding the open ended container with a liquid tight enclosure so as to create an annular space between the open ended container and the liquid tight enclosure,
(d) partially filling the liquid tight enclosure so as to submerge the porous bed to at least half its vertical height,
(e) directing a stream of pressurized gas and particulate matter to a submerged location vertically beneath the porous bed,
(f) passing the stream of gas through the porous bed so as to remove the particulate matter and to reduce the density of liquid within the porous bed and to cause the liquid in the porous bed to be pumped up over the side walls of the open ended container and into the annular space due to the density difference between the liquid in the porous bed and the annular space and to further cause liquid to flow from the annular space into the porous bed through the bottom of the open ended container to replace the pumped liquid, thereby creating a circulation of liquid between the porous bed and the annular space which cleans particulate matter from the porous bed by said liquid circulation.

4,432,778

FLUIDIC SWITCHED FLUID CLEANING

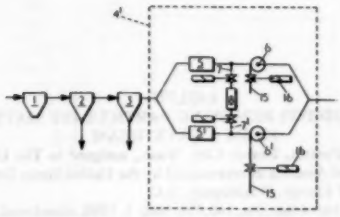
Michael J. Parkinson; Anthony W. Jury, both of Tewkesbury, England; Nicholas Syred, Llenisben, and Ieuan Owen, Pentwyn, both of Wales, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 227,487, Jan. 22, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 478,029

Claims priority, application United Kingdom, Feb. 8, 1980, 8004245

Int. Cl.³ B01D *46/44*

U.S. Cl. 55—212 9 Claims



1. An improved hot gas cleaning system for removal of solid particles of mesh size 10 μm and lower, and aerosols from a hot gas stream, wherein a line for carrying hot gases including solids and aerosols, having had the majority of solids removed, is split into a plurality of lines, each one comprising;

a particle and aerosol collector to clean the gas including an associated cleaning means to clean the collector, and; a vortex amplifier, positioned in the stream of the particle and aerosol flow, which can, by use of control gas, be made to open or close the line to hot gas flow in which it is included, such closing of the line to hot gas flow allowing the particle and aerosol collector to be cleaned by its cleaning means

whereby the whole system operates in such a manner that at any time only one line is closed to hot gas flow, while having its particle and aerosol collector cleaned, each collector being able to take the whole of the flow so that the total flow of hot gas is largely unaffected.

4,432,779

SYSTEM OF GAS DEHYDRATION USING LIQUID DESICCANTS

Joseph D. Honerkamp, and Harold O. Ebeling, both of Tulsa, Okla., assignors to Latoka Engineering, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 421,568, Sep. 22, 1982, which is a continuation-in-part of Ser. No. 227,798, Jan. 23, 1981, Pat. No. 4,375,977. This application Mar. 4, 1983, Ser. No. 472,088

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—233 5 Claims

1. An absorber for contacting gas having water therein with a liquid desiccant comprising:

an upright vessel having a lower and an upper horizontal partition dividing the vessel interior into upper, intermediate, and lower zones, the vessel having a gas inlet in the upper zone and a gas outlet in the upper part of the upper zone, each of the partitions having a plurality of spaced apart openings therein;

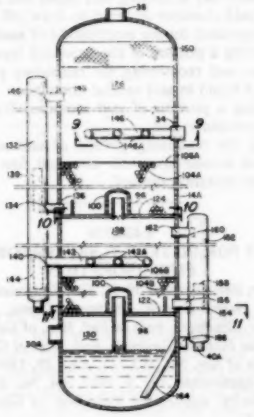
a short length vertical cylindrical member supported in each of said openings in each of said partitions, the lower end of each extending below its partition and the upper end of each extending above its said partition;

a cap covering the upper portion of each of said cylindrical members, the internal diameter of the caps being greater than the external diameter of said cylindrical members, the caps having passageways therein below the upper ends of said cylindrical members;

packing within said vessel intermediate and upper zones supported on said partitions and of depths greater than the height of said caps;

a desiccant entry in said vessel upper zone above said packing;

a desiccant outlet in the lower portion of said upper zone extending exteriorally of said vessel;



a desiccant inlet in said intermediate zone above said packing;

means communicating said desiccant outlet with said intermediate zone desiccant inlet; and

a liquid outlet in the lower portion of said intermediate zone.

4,432,780

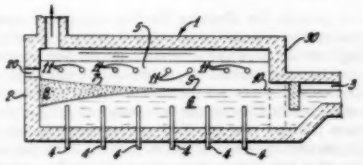
GLASS FIBER SCRAP RECLAMATION

Mark A. Propster, Gahanna; Charles M. Hohman, and William L. Streicher, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 27, 1982, Ser. No. 412,337

Int. Cl.³ C03B *5/16*

U.S. Cl. 65—2 10 Claims

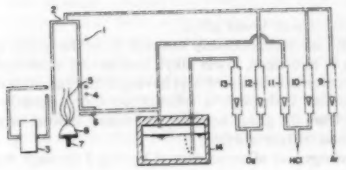


1. A method of processing chemically-coated glass fibers which comprises introducing the fibers in discrete form in an oxidizing gaseous stream the stream being supplied in an amount sufficient to transport the coated glass fibers into hot oxidizing gases above the glass batch within a glass melting furnace to oxidize at least a portion of the chemical coating from the surface of the fibers, accumulating some portion of the glass fibers on said unmelted batch and moving said portion of the glass fibers and said unmelted batch through said furnace to melt the fibers and commingle the melted fibers and the melted batch as molten glass.

4,432,781
METHOD FOR MANUFACTURING FUSED QUARTZ GLASS

Haruo Okamoto, and Motoyuki Yamada, both of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,856
Claims priority, application Japan, Mar. 6, 1981, 56-32352
Int. Cl.³ C03B *20/00, 19/00*
U.S. Cl. 65—18.2 3 Claims

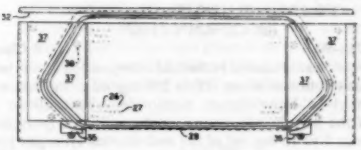


1. A method for manufacturing fused quartz glass with a controlled amount of hydroxy groups which method comprises admixing gaseous hydrogen chloride and oxygen with the vapor of a vaporizable silicon compound to form a gaseous reactant mixture, blowing the gaseous reactant mixture into a plasma flame formed with a gas flow of a plasma-supporting gas selected from the group consisting of oxygen, argon and mixtures thereof, whereby the silicon compound is decomposed and oxidized into silicon dioxide which is molten at the temperature of the plasma flame, and depositing the molten silicon dioxide on a substrate below the plasma flame to form said glass.

4,432,782
SUPPORT FOR HOT GLASS SHEETS OF NON-RECTANGULAR OUTLINE PRIOR TO BENDING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1982, Ser. No. 389,312
Int. Cl.³ C03B *23/035*
U.S. Cl. 65—25.2 13 Claims



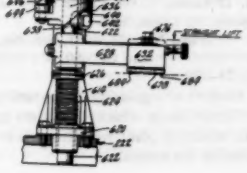
1. Apparatus for supporting a flat glass sheet in position to be lifted by a ring-like lifting member having a plan outline and curved elevational shape conforming to that desired immediately within the perimeter of said glass sheet, said apparatus comprising a gas hearth bed portion having at least one dimension shorter than the corresponding dimension of said flat glass sheet, said ring-like lifting member surrounding said gas hearth bed portion, said bed portion having an essentially horizontal, flat, apertured upper wall, means to impart hot gas through said upper wall at a rate sufficient to float said glass sheet in closely spaced relation to said flat upper wall and to permit at least some of said hot gas to be deflected to flow beyond the edge of said upper wall, flat plate means supported adjacent an end of said upper wall and extending essentially horizontally therefrom to be in position to form an extension of said upper wall, said flat plate means comprising a pair of flat imperforate plates spaced from one another in a common essentially horizontal plane to define an elongated groove conforming to a portion of the periphery of said glass sheet, means for moving said ring-like member between a recessed position below said upper wall and said flat imperforate plates through said elongated groove between said flat imperforate plates.

11. A method of supporting a flat glass sheet having a main portion and an end portion extending therefrom, comprising supporting the main portion thereof by gas in closely spaced relation over an upper, apertured wall of a gas hearth bed portion and supporting said end portion of said flat glass sheet extending from said main glass sheet portion in closely spaced relation to imperforate flat plate means extending from said upper apertured wall to a position in a common support plane slightly below at least a portion of the periphery of said flat glass sheet, whereby at least some of said gas that supports the main portion of said flat glass sheet is deflected to move along the lower surface of said flat glass sheet through a position between said portion of said glass sheet periphery and said flat plate means to control sag in said end portion of said glass sheet.

4,432,783
GLASSWARE FORMING APPARATUS

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 375,845, May 7, 1982, abandoned, which is a division of Ser. No. 179,381, Aug. 18, 1980, Pat. No. 4,339,264. This application Apr. 13, 1983, Ser. No. 484,658
Int. Cl.³ C03B *9/36*
U.S. Cl. 65—239 4 Claims



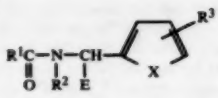
1. A blowhead mechanism for a glassware forming machine, said mechanism comprising a shaft rotatably mounted on said machine, a blowhead arm attached to said shaft and including at least one blowhead, and means mounted about said shaft and positioned above said blowhead arm for imparting movement to said blowhead arm from a first position to a second position during which said shaft first rotates about its axis and then is moved axially vertically and from a second position to a first position during which the shaft is first moved axially vertically and then rotated about its axis.

4,432,784
BIOLOGICALLY ACTIVE HETEROCYCLIC COMPOUNDS

Ian T. Kay, Wokingham, and Robert A. Noon, London, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 10, 1982, Ser. No. 356,801
Claims priority, application United Kingdom, Mar. 19, 1981, 8108676
Int. Cl.³ A01N *43/08, 43/10;* C07D *307/54, 333/24*
U.S. Cl. 71—88 9 Claims

1. N-Heterocyclylmethyl amides of the formula (I)



(I)

wherein R^1 is phenyl; phenyl bearing from 1 to 3 substituents selected from the group consisting of halogen, alkyl, alkoxy, halo alkyl, halo alkoxy, methylenedioxy and cyano; 2-furyl, 2-thienyl or 4-pyridyl;

R^2 is hydrogen, alkyl of 1 to 4 carbon atoms or alkenyl of 3 to 5 carbon atoms, said alkyl or alkenyl being either unsubstituted or substituted with C_1–C_4 alkoxy, C_1–C_4 alkylthio, or halogen;

E is —CN, alkoxycarbonyl, or a —$CONR^4R^5$ group wherein R^4 and R^5 may each be hydrogen, alkyl or alkenyl radical;

X is oxygen or sulphur,

and R^3 represents hydrogen, methyl or chlorine.

8. A process for combating fungi which comprises applying to the locus of the fungi or a plant, or to the seed of the plant or locus thereof, a fungicidally effective, but non-phytotoxic, amount of an amide derivative as defined in claim 1.

9. A process of inhibiting the growth of unwanted plants which comprises applying to the plants, or to the locus thereof, a phytotoxic amount of a compound as defined in claim 1.

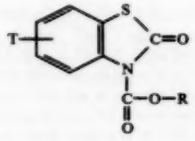
4,432,785

N-SUBSTITUTED-OXOBENZOTHIAZOLINE DERIVATIVES USEFUL AS PLANT GROWTH REGULANTS

John J. D'Amico, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 27, 1981, Ser. No. 325,468
Int. Cl.³ A01N *43/78*
U.S. Cl. 71—90 **9 Claims**

1. A method of regulating the natural growth and development of crop plants which comprises applying to the plant locus an effective plant regulating, non-lethal, amount of a compound of the formula



wherein R is equal to $C_{1\text{-}5}$ alkyl, $C_{2\text{-}5}$ alkenyl, $C_{2\text{-}5}$ alkynyl, haloalkyl, phenyl or phenyl substituted by one or two halogen, $C_{1\text{-}5}$ alkyl, $C_{1\text{-}5}$ alkoxy or haloalkyl moieties; T is equal to $C_{1\text{-}5}$ alkyl, $C_{1\text{-}5}$ alkoxy, halogen or haloalkyl.

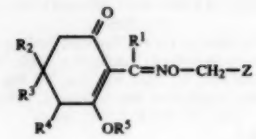
4,432,786

THIENYLMETHOXYIMINOALKYL CYCLOHEXANEDIONE HERBICIDES

William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 10, 1982, Ser. No. 376,325
Int. Cl.³ A01N *43/02*; C09B *23/16*
U.S. Cl. 71—90 **28 Claims**

1. A compound selected from the group having the formula:



wherein

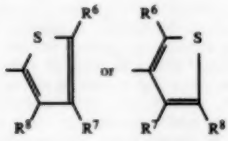
R^1 is hydrogen or lower alkyl;

R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl, aryl having 6 through 10 carbon atoms, substituted aryl having 6 through 10 carbon atoms, and 1 through 4 substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, and trifluoromethyl;

R^4 is hydrogen or alkoxycarbonyl having 2 through 4 carbon atoms;

R^5 is hydrogen; and

Z is a group having the formula:



wherein R^6, R^7, and R^8 are independently selected from the group of hydrogen, halo, nitro, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, or trifluoromethyl; and cation salts thereof.

4,432,787

CONCENTRATED EMETIC HERBICIDAL COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Jerry P. Milionis, Somerset, and Joel E. Fischer, Hightstown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,545
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—94 **6 Claims**

1. A concentrated emetic herbicidal composition comprising an aqueous solution of about 100 to 250 mg/ml of the cation of 1,1'-dimethyl-4,4'-bipyridinium dichloride; about 10 to 20 mg/ml of the peripherally-acting emetic sodium tripolyphosphate; about 5 to 10 mg/ml of the malodorous synergist pyridine for the peripheral emetic; and about 45 to 67.5 mg/ml of a nonionic surfactant.

4,432,788

METHOD FOR MANUFACTURING NON-FIRED IRON-BEARING PELLET

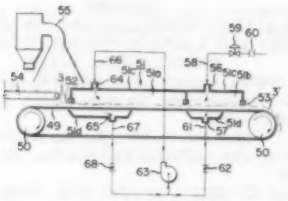
Michio Nakayama, Kawasaki; Osamu Tajima, Kamakura; Seiji Matsui, Kawasaki; Hideyuki Yoshikoshi, Hino, and Hiroshi Fukuyo, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,199
Claims priority, application Japan, Apr. 23, 1981, 56-60640; Apr. 23, 1981, 56-60641
Int. Cl.³ C22B *1/08*
U.S. Cl. 75—3 **2 Claims**

1. An improved process for manufacturing a non-fired iron-bearing pellet, which comprises:

mixing a hydraulic binder and water with raw materials which comprise at least one of (i) iron ore fines and (ii) dust mainly comprising iron oxides, to form a mixture; forming said mixture into green iron-bearing pellets; con-

tinuously supplying said green iron-bearing pellets into a treating furnace which comprises a preheating zone and a heating zone; blowing a heating gas containing saturated steam having a temperature of from 50° to 100° C. into said heating zone to contact and to heat the green iron-bearing pellets in said heating zone to the temperature of said heating gas and to condense at least part of said saturated steam contained in said heating gas by heat exchange with said green iron-bearing pellets by said contact and said heating; utilizing said heating gas, which in the heating zone had been used to heat said green iron-bearing pellets and contains said saturated steam at least part of which had been condensed, as a preheating gas in said preheating zone of said treating furnace to preheat the green iron-bearing pellets in said preheating zone to a temperature of from 40° to 90° C.; and maintaining said green iron-bearing pellets thus preheated and then heated,



at the temperature of from 50° to 100° C. for sufficient time to harden said green iron-bearing pellets; thereby continuously manufacturing non-fired iron-bearing pellets;

the improvement comprising

withdrawing from said heating zone said (i) heating gas which had been used to heat the green iron-bearing pellets in said heating zone before said heating gas is introduced into said preheating zone to preheat the green iron-bearing pellets therein, and withdrawing from said preheating zone said (ii) preheating gas which had been used to preheat the green iron-bearing pellets therein and mixing said withdrawn gases (i) and (ii) in a ratio to have the desired preheating temperature and form the preheating gas which is used to heat said green iron-bearing pellets in said pre-heating zone and recirculating said preheating gas to said preheating zone, thereby preheating said green iron-bearing pellets.

4,432,789

METHOD OF MINIMIZING ENERGY CONSUMPTION WHEN REDUCING IRON OXIDE WITH REDUCING GASES

Göran Mathisson, and Sven Santen, both of Hofors, Sweden, assignors to SKF Steel Engineering, Hofors, Sweden

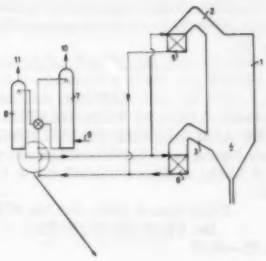
Filed Jan. 24, 1983, Ser. No. 460,499

Claims priority, application Sweden, Mar. 2, 1982, 8201273

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—35 **8 Claims**

1. A method of reducing iron oxide so as to produce sponge iron in a shaft furnace having upper and lower portions, said method comprising the steps of supplying a hot reducing gas to the lower portion of the shaft furnace, passing the reducing gas upwardly through the iron oxide contained in the shaft furnace, withdrawing the reducing gas from the upper portion of the shaft furnace, passing the reducing gas from the upper portion of the shaft furnace through a CO_2 wash so as to remove substantially all CO_2 from said gas, and thereafter recirculating at least a portion of said gas into the lower portion of said furnace, said method further comprising using a wash liquid in said CO_2 wash to remove said CO_2 from said reducing gas, regenerating said wash liquid for reuse in said CO_2 wash by supplying heat to said wash liquid, and obtaining said heat



from the physical heat contained in the reducing gas which is removed from the upper portion of the shaft furnace.

4,432,790

BLAST FURNACE CONTROL METHOD

Marvin H. Bayewitz, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 237,331, Feb. 23, 1981, abandoned. This application Jun. 23, 1982, Ser. No. 391,329

Int. Cl.³ C21B *5/06*

U.S. Cl. 75—41 **25 Claims**

1. A feedback control scheme for maintaining a substantially uniform operation of a blast furnace wherein solid iron-containing materials, carbon-containing fuel and fluxstone are charged into the top of the furnace and pass downwardly in the furnace and pressurized heated blast air is passed into the furnace through its tuyeres into the tuyere region of the furnace and the oxygen in the blast air combines with carbon in the fuel to provide reducing gases and high temperature heat that are required to melt and reduce the iron-containing materials to produce molten iron containing a desired silicon content, which molten iron is collected in the hearth of the furnace and to melt the fluxstone, which reacts with impurities charged into the furnace to form a fluid slag which floats atop the molten iron and protects the molten iron from impurities, the scheme comprising:

(a) continuously accurately analyzing the composition of the top gas emitted from the furnace,

(b) storing the analyses in a computer,

(c) determining an average of the top gas analyses at a predetermined period of time,

(d) determining a high temperature heat (HTH) value and a (CEEP) value for each period of time using the average of the top gas analyses determined in step (c) in mass and heat balance calculations,

(e) storing the (HTH) values and CEEP values determined in step (d) in the computer,

(f) determining a base period of operation of the blast furnace wherein the silicon content of the hot metal produced was within a predetermined range of the aim silicon content for the type of hot metal produced,

(g) determining the average of the high temperature heat values as determined in step (d) from a base period of operation of step (f),

(h) determining a difference between the high temperature heat for a current period of operation and the average value of the high temperature heat of step (g), which difference may be identified as DEL1,

(i) determining the sum of the values from step (h) for the current hour and previous hour of operation, which sum may be identified as DEL2,

(j) determining the average of the CEEP values of a recent period of operation,

(k) determining the difference between the CEEP average

of step (j) and the average CEEP for a prior period of operation, and

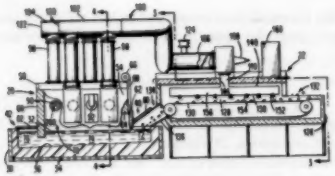
(l) regulating the temperature and/or moisture content of the hot blast air as recommended by the values of DEL1 in step (h), DEL2 in step (i), and the CEEP difference in step (k).

4,432,791

CERAMIC RADIANT TUBE HEATED ALUMINUM MELTER AND METHOD OF MELTING ALUMINIUM

Viswanath Jayaraman, Livonia, and Mahendra R. Shah, Canton, both of Mich., assignors to Holcroft & Company, Livonia, Mich.

Filed Mar. 4, 1983, Ser. No. 472,425
Int. Cl.³ C21C *21/00*; F27B *3/26*
U.S. Cl. 75—65 R **15 Claims**



1. In an aluminum melting system including a melting vessel, a housing having endwalls submergeable in a molten aluminum bath held by said vessel during operation of the system, said housing dividing the vessel into a charge zone, a heating zone, and a discharge zone interconnected below said endwalls, and means for delivering heat to said aluminum bath in said heating zone, the improvement wherein said means for delivering heat comprises a plurality of ceramic tubes extending between opposed walls of said housing, a burner at one end of each of said tubes, said burners operable to fire hot gases into said tubes, and further including:

recuperator means for collecting the combustion products from the ends of said tubes remote from said burners and preheating combustion air for said burners by passing said air in heat exchange relationship with said combustion products; and

a stock preheater operable to receive said combustion products from said recuperator means and to direct said combustion products into contact with solid aluminum stock prior to delivery of said solid stock into the charge zone of said vessel.

4,432,792

MATERIAL FOR STEEL WOOL

Heijiro Kawakami, Kobe; Sadayoshi Furusawa, Mitaka; Toyofumi Hasegawa; Hitoshi Sato, both of Kobe; Katsumasa Tanaka, Ono, and Jiro Koarai, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 30, 1982, Ser. No. 429,619
Claims priority, application Japan, Oct. 2, 1981, 56-157108
Int. Cl.³ C22C *38/00*
U.S. Cl. 75—123 R **1 Claim**

1. A material for steel wool essentially consisting of 0.05 to 0.20% of C, up to 0.10% of Si, 0.50 to 1.30% of Mn, 0.035 to 0.10% of P, up to 0.04% of S, 0.005 to 0.015% of N, and the balance of Fe, Al_2O_3 inclusions with sizes not smaller than 3 microns being so controlled that their content is suppressed to a level not greater than 20 ppm of the total content of the material for steel wool and when the content of the Al_2O_3 inclusions with sizes not smaller than 3 microns is within the range of 5 to 20 ppm, Al_2O_3 inclusions having a size ranging from 3 to 10 microns are not less than 30% of the total content of the Al_2O_3 inclusions with sizes not smaller than 3 microns.

4,432,793

FERROALLOY FOR THE TREATMENT OF CAST METALS AND PROCESS

Pierre Hilaire, Louveciennes, France; Franz Lietaert, Zwijnaarde, Belgium; Claude Staroz, Puteaux, France, and Walter Schumacher, Dusseldorf, Fed. Rep. of Germany, assignors to Societe Nobel Bozel, Puteaux, France

Filed Jul. 30, 1982, Ser. No. 403,726
Claims priority, application France, Aug. 4, 1981, 81 15110
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 R **10 Claims**

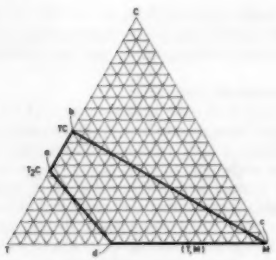
1. A ferroalloy for the treatment by inoculation of cast metals with spheroidal graphite comprising from 0.005 to 3% by weight of at least one metal of the rare earth group and from 0.05 to 3% by weight of at least one element taken from the group consisting of bismuth, lead and antimony, the remainder being essentially silicon and the balance iron.

4,432,794

HARD ALLOY COMPRISING ONE OR MORE HARD PHASES AND A BINARY OR MULTICOMPONENT BINDER METAL ALLOY

Helmut Holleck, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 286,376
Claims priority, application European Pat. Off., Jul. 19, 1980, 80104274
Int. Cl.³ B22F *3/16*; C22C *14/00, 27/00, 28/00*
U.S. Cl. 75—239 **14 Claims**



1. A hard alloy comprising at least one hard phase and a binary or multicomponent binder metal alloy, said hard alloy comprising a finely dispersed, homogeneous distribution of said at least one hard phase in said binder metal alloy, said at least one hard phase comprising a carbide of a transition metal of Group IVb, Vb or VIb of the Periodic Table of Elements, and said binder metal alloy comprising a solid alloy of a transition metal of Group IVb, Vb or VIb of the Periodic Table of Elements, with Ru, Rh, Pd, Os, Ir or Pt, with the proportion of transition metal in said binder metal alloy comprising 2 to 60 mole percent, and the remaining 98 to 40 mole percent of said binder metal alloy comprising (a), Ru, Rh, Pd, Os, Ir or Pt, and (b) 0 to 90 atom percent Fe, Ni or Co, the atom percent of Fe, Ni or Co being based on the total atom percent of Ru, Rh, Pd, Os, Ir, Pt, Fe, Ni and Co percent.

4,432,795

SINTERED POWDERED TITANIUM ALLOY AND METHOD OF PRODUCING SAME

Phillip J. Andersen, Cleveland Heights, Ohio, assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 97,508, Nov. 26, 1979, abandoned. This application Feb. 16, 1982, Ser. No. 349,432
Int. Cl.³ C22C *14/00, 1/04*; B22F *1/00*
U.S. Cl. 75—245 **7 Claims**

1. A process for producing a sintered powdered titanium

alloy article having a density near theoretical while minimizing the amount of fine particles required to obtain satisfactory densification which comprises:

(a) providing alloy-forming particles which have been milled to an average particle size ranging from about 0.5 to 20.0 microns, said particles being capable of alloying with titanium;

(b) mixing said alloy-forming particles in the as-milled condition with titanium-base particles having an average particle size ranging from about 40 to 177 microns so as to form a powder mixture containing about 70–95 weight percent of said titanium-base particles and the balance substantially said alloy-forming particles;

(c) compacting said powder mixture into an article of the desired configuration having a green density ranging from about 80 to 90 percent of theoretical density sufficient to render said article capable of being sintered to near theoretical density; and

(d) sintering said article at an elevated temperature below that at which any liquid phase is formed in said article, whereby said article has physical properties similar to a wrought produced article.

4,432,796

PROCESS FOR THE CONDITIONING OF AN ORGANIC PIGMENT

John F. Santimauro, Wyckoff, N.J., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 304,127, Sep. 21, 1981, abandoned. This application Mar. 1, 1983, Ser. No. 469,021

Int. Cl.³ C08K *5/20, 5/56;* **C09D** *11/00*

U.S. Cl. 106—19 **9 Claims**

1. A process for the conditioning of a crude pigment which comprises treating a crude pigment selected from the group consisting of Pigment Red 123, Pigment Red 190, Pigment Yellow 112, Pigment Blue 15 and Pigment Violet 23 with polyphosphoric acid and drowning the mixture in such an amount of water, ice, a water-miscible organic liquid or a mixture of these substances so that the H_3PO_4 equivalent of the resulting mixture is below 40%, the amount of said polyphosphoric acid being 2 to 20 parts by weight based on 1 part by weight of the 100% pigment and wherein the process is conducted at a temperature of between about 20° C. and about 200° C.

4,432,797

WATER BASED THICKENED STAIN

Ramesh C. Vasishth, Danville, and Robert S. Wang, Concord, both of Calif., assignors to Envirosol Systems International, Ltd., Orinda, Calif.

Filed Mar. 11, 1982, Ser. No. 357,033

Int. Cl.³ B05D *3/02;* **C09D** *15/00*

U.S. Cl. 106—34 **10 Claims**

1. A water borne wood stain resistant to pigment settling prior to use comprising: a dispersed pigment for staining wood, water and sufficient nonfilm forming water thickener to raise the solution viscosity to a level which creates a gelled structure in the stain to substantially reduce pigment settling.

4,432,798

ALUMINOSILICATE HYDROGEL BONDED AGGREGATE ARTICLES

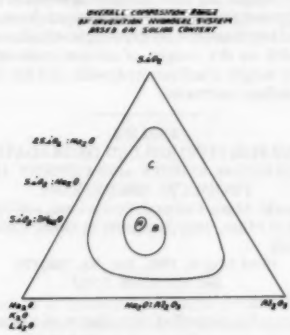
Richard L. Helferich, Clayton, and William B. Shook, Columbus, both of Ohio, assignors to The Duriron Company, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 217,203, Dec. 16, 1980, Pat. No. 4,357,165, which is a continuation of Ser. No. 908,802, Nov. 8, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,715

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.³ B28B *7/34*

U.S. Cl. 106—38.3 **23 Claims**



1. Rigidified formed articles of aggregate/binder compositions which are at least sufficiently fluid or plastic when prepared to enable them to be formed into said article and which are self-setting under ambient conditions to effect rigidification thereof,

said composition comprising an inert aggregate material, more than 10% by weight of an aluminosilicate hydrogel binder bonding said aggregate material together to form said rigidified article, and at least one gel modifying filler selected from the group consisting of clays, compounds of Group II and III metals of the period and zinc, zirconium and titanium compounds which form insoluble alkali salts with said binder,

said aggregate material principally comprising discrete particulate matter which when bound together in said rigidified condition constitutes the skeletal base of said articles,

said aluminosilicate hydrogel binder having compositional limits, exclusive of its water content, of from 10–60 weight percent total alkali, 10–70 weight percent alumina and 10–80 weight percent silica, wherein the mole ratio of alumina-to-silica is from 0.07 to about 4.20, a total solids content of said binder of 10–50 weight percent, the balance essentially water.

4,432,799

REFRACTORY COMPOSITIONS AND METHOD

Paul V. Salazar, 1506 Clinton Pl., River Forest, Ill. 60305

Filed Mar. 8, 1982, Ser. No. 355,320

Int. Cl.³ C04B *9/04*

U.S. Cl. 106—85 **6 Claims**

1. A basic refractory composition which, when wetted, forms a magnesium aluminum phosphate bond comprising:

A magnesium oxide source: 20–94%;

Aluminum phosphate: 5–70%; and

an insulating material selected from the group consisting of perlite, vermiculite, diatomaceous earth, and mixtures thereof in an amount of 5–60% based on the total weight of the composition.

4,432,800

BENEFICIATING KILN DUSTS UTILIZED IN POZZOLANIC REACTIONS

William A. Kneller, and John P. Nicholson, both of Toledo, Ohio, assignors to N-Viro Energy Systems Ltd., Toledo, Ohio

Filed Aug. 16, 1982, Ser. No. 408,173
Int. Cl.³ C04B 7/26
U.S. Cl. 106—85 21 Claims

1. A mixture consisting essentially of pozzolan, kiln dust, a filler, and a small amount of material selected from the group comprising calcium oxide, calcium hydroxide, and sodium hydroxide, which through pozzolanic reactions produces a durable mass, the pozzolan comprising between about 6 and 24% by dry weight, the kiln dust comprising between 4 and 16% by dry weight, the filler comprising between about 60 to 90% by dry weight, the material selected from the group consisting of less than 1.5% by dry weight, of calcium oxide, of less than 2.0% by dry weight, of calcium oxide, of less than 2.0% by dry weight of calcium hydroxide, and less than 1% by weight of sodium hydroxide.

4,432,801

PROCESS FOR CONTROLLED DEGRADATION OF LIQUID GLUCOSE SYRUPS AND CEMENT ADDITIVE PRODUCTS THEREFROM

Fabio Tegiacchi; Mario Chiruzzi; Benito Casu, and Giangiacomo Torri, all of Milan, Italy, assignors to Grace Italiana S.p.A., Milan, Italy

Filed May 4, 1981, Ser. No. 260,476
Int. Cl.³ C04B 7/352
U.S. Cl. 106—92 18 Claims

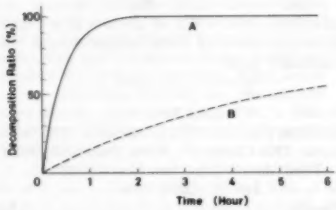
1. A process for controlled degradation of a glucose syrup comprising glucose, maltose, and maltodextrins, said process comprising the steps of providing said glucose syrup in concentrated solution in homogeneous phase and treating said glucose syrup with an oxidizer or aqueous alkaline solution to degrade the reducing groups of said glucose, maltose, and maltodextrins without substantially modifying the polysaccharidic components of maltodextrin of said syrup having a degree of polymerization greater than 3 or with only partial depolymerization of said polysaccharidic components.

4,432,802

INCLUSION COMPOUND-CONTAINING COMPOSITE

Kazuaki Harata; Satoshi Morimoto, and Keishiro Tsuda, all of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology Ministry of International Trade & Industry, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,214
Claims priority, application Japan, Feb. 4, 1981, 56-15254
Int. Cl.³ C08L 1/02, 1/08; A61K 9/36
U.S. Cl. 106—163 R 6 Claims



1. An inclusion compound-containing composite, comprising a closed container formed partially or wholly of permeable membrane and an inclusion compound enclosed by said container, wherein said enclosed inclusion compound consists of a water-soluble cyclodextrin polymer incapable of permeating said membrane and an active component capable of permeating said membrane, whereby the composite releases said active component steadily over a long period of time.

4,432,803

IRON OXIDE PAINT PIGMENT PRECURSOR

Henry W. Hitzrot, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 103,144, Dec. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,550, Dec. 1, 1978, Pat. No. 4,190,422, which is continuation-in-part of Ser. No. 906,310, May 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,116, May 24, 1977, abandoned. This application Jan. 21, 1981, Ser. No. 226,680
Int. Cl.³ C09C 1/24
U.S. Cl. 106—304 3 Claims

1. In a process for producing yellow iron oxide paint pigment wherein iron-containing particles together with nitrobenzene, aluminum chloride and hydrochloric acid are charged into an autoclave and are heated under pressure, and the nitrobenzene is reduced to aniline and substantially all the iron is oxidized to iron oxides with a negligible amount of iron remaining unreacted and a negligible amount of residual salts are formed as well as water; and wherein the aniline is separated from the iron oxides, the unreacted iron and the residual salts and the water, and the iron oxides are treated to remove the unreacted iron and the residual salts to leave substantially pure yellow iron oxides, the iron-containing particles which are charged into the autoclave being a waste material comprised of metallic cores derived from scarfer spittings and characterized by a composition consisting essentially of not more than:

0.10 weight percent carbon,
0.25 weight percent manganese,
0.025 weight percent phosphorus.
0.01 weight percent sulfur,
0.05 weight percent silicon,
0.10 weight percent chromium,

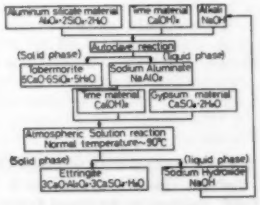
the remainder iron and having a particle size within the range of about 5 mm and 0.125 mm.

4,432,804

PROCESS FOR PRODUCING A MIXTURE OF TOBERMORITE AND ETTRINGITE

Hideo Tamura, Takarazuka, and Seiro Ibuki, Kusatsu, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Continuation of Ser. No. 150,131, May 15, 1980, abandoned, which is a division of Ser. No. 51,057, Jun. 22, 1979, Pat. No. 4,243,429. This application Mar. 10, 1981, Ser. No. 242,230
Claims priority, application Japan, Jun. 22, 1978, 53-76143; Jun. 22, 1978, 53-76145
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.³ C09C 1/02; C01B 33/24; C01F 7/76
U.S. Cl. 106—306 5 Claims



1. A process for producing a mixture of tobermorite and ettringite characterized by the steps of:

(1) admixing an alumina-containing siliceous material and a lime material with an alkali solution;

(2) subjecting the resulting mixture to hydrothermal reaction with water at 4 to 40 kg/cm² to form tobermorite;

(3) admixing a lime material and a gypsum material with the resulting alkali reaction product in the reaction mixture containing the tobermorite and reacting the mixture at

room temperature to a temperature of up to 90° C. to form ettringite;

(4) filtering the reaction mixture from step (3) to obtain a filtrate separated from the mixture of tobermorite and ettringite, recycling the filtrate to step (1) for use as alkali solution and repeating steps (1)–(3).

4,432,805

METHOD FOR CONTINUOUS SACCHARIFICATION OF CELLULOSE OF PLANT RAW MATERIAL

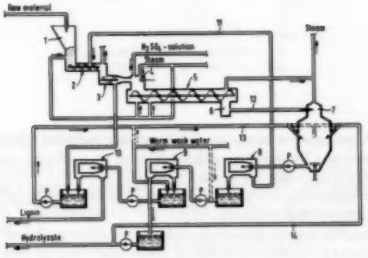
Antti I. Nuuttila, Tampere, and Veikko J. Pohjola, Veikkola, both of Finland, assignors to Oy Tampella AB, Finland

Continuation of Ser. No. 217,514, Dec. 17, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,442

Claims priority, application Finland, Dec. 18, 1979, 793963

Int. Cl.³ C13K *1/02*

U.S. Cl. 127—37 **8 Claims**



1. A method for continuous saccharification of a plant raw material comprising:

feeding both the raw material and a dilute sulfuric acid solution through a flow reactor at a flow rate required to hydrolyze under pressure and at elevated temperature the more easily hydrolyzable particles of the raw material and maintaining the pressure and temperature required for hydrolysis in the reactor, the detention time of said raw material and said dilute sulfuric acid in said flow reactor being substantially equal;

discharging dry solids and liquid containing monosaccharides together from the reactor into a common blow tank by expansion;

separating in a separator the liquid and solids into one fraction containing liquid and fine solids and a second fraction containing coarse solids and recovering the liquid as a monosaccharide product while discharging the fine solids which contain mainly lignin; and

recycling at least part of the separated coarse solids into the reactor.

4,432,806

METHOD OF PURIFYING SUGAR JUICE PREPARED BY EXTRACTION OF A SUGAR BEET MATERIAL

Rud F. Madsen, Strandpromenaden; Werner K. Nielsen, and Steen Kristensen, both of Bresemannsalle, all of Denmark, assignors to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Jan. 8, 1982, Ser. No. 338,071

Claims priority, application Sweden, Jan. 14, 1981, 8100186

Int. Cl.³ C13D *3/16*

U.S. Cl. 127—48 **14 Claims**

1. A method of purifying sugar juice which has been extracted from a sugar beet material, said method comprising the steps of (a) filtering the sugar juice to remove undissolved components therefrom, (b) adding to the filtered sugar juice obtained in step (a) a chemical selected from the group consisting of oxidants, complexing agents and mixtures thereof in an amount sufficient to convert low molecular weight colored components in the filtered sugar juice into compounds of a molecular weight sufficiently high that they can be separated from the filtered sugar juice by ultrafiltration, and (c) ultrafiltering the chemically treated sugar juice obtained in step (b) to provide a retentate containing the high molecular weight compounds and a permeate in the form of a purified sugar juice concentrate.

4,432,807

METHOD OF EXFOLIATING COATING OF COATED OPTICAL FIBER

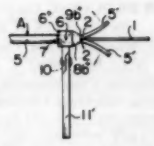
Yusei Shirasaka; Kenichi Fuse, and Haruo Umezu, all of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,003

Claims priority, application Japan, Mar. 25, 1981, 56-43495

Int. Cl.³ C03C *23/00*; B08B *7/00*

U.S. Cl. 134—2 **14 Claims**



1. A method of exfoliating a coated optical fiber in which fibrous materials are contained along the longitudinal direction of the optical fiber in the coating layer on the outer periphery of the optical fiber comprising:

producing a crack of longitudinal direction of the optical fiber in the coating layer at the end of the coated optical fiber to be exfoliated and cleaving the cracked coating layer into a plurality of cleaved strip pieces while growing the crack, and

outwardly bending the cleaved strip pieces at the edges provided at the positions to be exfoliated of the coating layer as basic points and bending off the cleaved strip pieces at the edges of the coating layer.

4,432,808

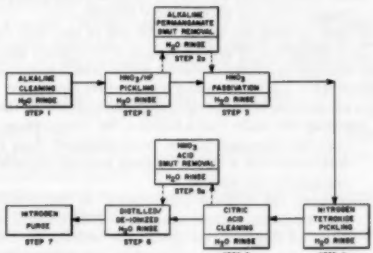
TREATMENT OF STAINLESS STEEL APPARATUS USED IN THE MANUFACTURE, TRANSPORT OR STORAGE OF NITROGEN OXIDES

Henry P. Heubusch, Buffalo, N.Y., assignor to Textron Inc., Providence, R.I.

Filed May 26, 1982, Ser. No. 382,112

Int. Cl.³ C23G *1/02*

U.S. Cl. 134—3 **17 Claims**



1. A method of cleaning and passivating a chromium containing stainless steel metal surface used in the manufacture,

transport or storage of highly pure nitrogen tetroxide comprising the steps of:

1. Cleaning said surface by contacting with an alkaline cleaner containing solution to remove fouling deposits and thereafter rinsing with water;
2. Pickling said surface by contacting with an aqueous nitric acid/hydrofluoric acid solution to remove oxides, carbonates and mill scale, and thereafter rinsing with water;
3. Passivating said surface by contacting with a nitric acid passivation solution and thereafter rinsing with water;
4. Pickling said surface by contacting with green nitrogen tetroxide and thereafter rinsing with water;
5. Cleaning said surface by contacting with a citric acid solution and thereafter rinsing with water;
6. Rinsing said surface with distilled or de-ionized water until said surface is chloride free; and
7. Purging said surface free of liquid with nitrogen.

4,432,809

METHOD FOR REDUCING OXYGEN PRECIPITATION IN SILICON WAFERS

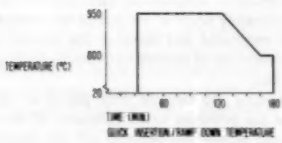
Patrick W. Chye, Mountain View, Calif.; Eric W. Hearn, Wappingers Falls, N.Y.; Murlidhar V. Kulkarni, Fishkill, N.Y., and Gary Markovits, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/01777, § 371 Date Mar. 10, 1982, § 102(e) Date Mar. 10, 1982, PCT Pub. No. WO83/02314, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 31, 1981, Ser. No. 364,542

Int. Cl.³ H01L *21/322, 21/324*

U.S. Cl. 148—1.5 **12 Claims**



1. A method of retarding oxygen precipitation and preventing warpage in a semiconductor wafer which is subject to heat treatment at a predetermined temperature during the manufacture of semiconductor circuits thereon, comprising the steps of:

preheating a furnace to the predetermined heat treatment temperature,

inserting the wafer into the preheated furnace in a manner which immediately exposes said semiconductor wafer to said predetermined heat treatment temperature and causes said semiconductor wafer to rapidly heat up to said predetermined heat temperature,

maintaining the furnace at said predetermined heat treatment temperature for about ninety minutes, and

slowly cooling the wafer at the end of said heat treatment.

2. A method of retarding oxygen precipitation and preventing warpage in a semiconductor wafer which is subject to heat treatment at a predetermined temperature during the manufacture of semiconductor circuits thereon, comprising the steps of:

inserting the wafer into a furnace, the temperature of which may be increased to the predetermined heat treatment temperature at a rate exceeding several hundred degrees centigrade per second,

increasing the furnace temperature to the predetermined heat treatment temperature at a rate exceeding several hundred degrees centigrade per second to thereby increase the wafer temperature to the predetermined heat treatment temperature at a rate exceeding several hundred degrees centigrade per second,

performing the heat treatment, and

slowly cooling the wafer at the end of said heat treatment.

4,432,810

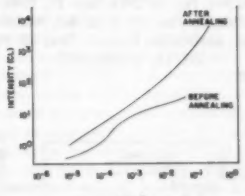
METHOD FOR IMPROVING LUMINESCENCE AND ELECTRICAL PROPERTIES IN SEMICONDUCTOR MATERIALS BY ELECTRON IRRADIATION AT LIQUID NITROGEN TEMPERATURES

Albert Sicignano, Mt. Kisco, N.Y.; Christiaan J. Werkhoven, and Werner F. van der Weg, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,128

Int. Cl.³ H01L *21/263*

U.S. Cl. 148—1.5 **11 Claims**



1. A process for annealing luminescence material comprising

inserting a luminescence material into an enclosed region,

providing a vacuum in said region,

simultaneously cooling said material to the vicinity of liquid nitrogen temperatures, and

thereafter exposing said material to an electron beam in the range of 20 to 27.5 KEV to cause annealing of said material.

4,432,811

METHOD OF MAKING SEAMLESS TUBING

Johann Stiebellehner, Pottschach, and Peter Machner, Leoben, both of Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Oct. 4, 1982, Ser. No. 432,762

Claims priority, application Austria, Oct. 8, 1981, 4313-81

Int. Cl.³ C21D *8/00*

U.S. Cl. 148—2 **6 Claims**

1. In a process for producing seamless tubes of austenitic chromium-nickel steels by continuous casting, wherein a metallic melt is poured continuously into a cooled mold having a round molding cavity, said melt being allowed to solidify partially in said cavity, and wherein a billet is extracted from said mold and cut into crosscut lengths after thoroughly hardening, the improvement comprising electromagnetically agitating said billet in a direction about its longitudinal axis prior to complete hardening, when said billet comprises a billet shell and a liquid billet core, annealing said crosscut continuous castings at a temperature of from 1100° C. to 1250° C. for a holding time between 30 minutes and 4 hours, cooling said casting and thereafter mechanically reducing said castings to extrusion blooms by machining, and extruding said blooms, without hot-working said blooms, to produce said seamless tubes.

4,432,812

DRIVE TRAIN GEAR OF LOWER BAINITE ALLOY STEEL

Stuart L. Rice, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 142,325, Apr. 21, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 483,961

Int. Cl.³ C21D *9/32*

U.S. Cl. 148—36 **9 Claims**

1. In a drive train gear of the type having a plurality of gear teeth thereon for meshing engagement with another gear, the improvement comprising:

said drive train gear being formed of alloy steel having a predominantly homogeneous and substantially complete low temperature bainite microstructure including one of cementite precipitated within the ferrite laths and epsilon carbide precipitated within the ferrite lath boundaries, the drive train gear having a hardness of at least Rc56 therethrough.

7. In a drive train gear of the type having a plurality of gear teeth thereon for meshing engagement with another gear, the improvement comprising:

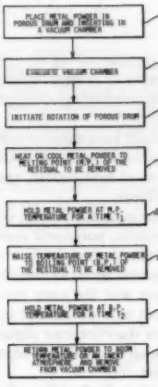
said drive train gear being formed of alloy steel consisting essentially of carbon in the range of 0.60 to 0.80 Wt.%, manganese in the range of 0.45 to 1.00 Wt.% silicon in the range of 0.15 to 2.20 Wt.%, and molybdenum in the range of 0.40 to 0.70 Wt.%, preferably but not essentially boron, and the balance substantially iron.

4,432,813

PROCESS FOR PRODUCING EXTREMELY LOW GAS AND RESIDUAL CONTENTS IN METAL POWDERS

Griffith E. Williams, 3250 W. 4100 S., Salt Lake City, Utah 84119

Filed Jan. 11, 1982, Ser. No. 338,389
Int. Cl.³ B22F *1/00*
U.S. Cl. 148—125 **24 Claims**


PLACE METAL POWDER IN POROUS DRUM AND INSERT IN A VACUUM CHAMBER
10
EVACUATE VACUUM CHAMBER
12
INITIATE ROTATION OF POROUS DRUM
14
HEAT OR COOL METAL POWDER TO MELTING POINT (±0.1) OF THE RESIDUAL TO BE REMOVED
16
HOLD METAL POWDER AT M.P. TEMPERATURE FOR A TIME T_1
18
RAISE TEMPERATURE OF METAL POWDER TO BOILING POINT (±0.1) OF THE RESIDUAL TO BE REMOVED
20
HOLD METAL POWDER AT B.P. TEMPERATURE FOR A TIME T_2
22
RETURN METAL POWDER TO ROOM TEMPERATURE OF AN INERT ATMOSPHERE AND REMOVE FROM VACUUM CHAMBER
24

1. A method for removing residual elements including dissolved, absorbed, adsorbed or otherwise occluded gases from metal powders comprising the steps of:

placing the metal powder in a vacuum chamber;

evacuating said vacuum chamber to reduce the atmosphere surrounding the metal powder to a vacuum;

subjecting the metal powder to the melting temperature of the residual element to be removed for a first predetermined period of time T_1;

elevating the temperature of the metal powder to the boiling temperature of the residual element to vaporize the residual element;

holding said metal powder at said boiling temperature for a second period of time T_2; and

returning the metal powder from said boiling temperature to room temperature prior to removing the metal powder from said vacuum chamber.

4,432,814

AZIDO ESTERS

Edward F. Witucki, Van Nuys, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 370,235, Apr. 21, 1982. This application Apr. 13, 1983, Ser. No. 484,735
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.1 **1 Claim**

1. A solid composite type propellant composition consisting essentially of a cured intimate mixture of:

A. an oxidizer component;

B. a synthetic resinous binder component; and

C. an energetic placticizer component consisting of 6-azidohexyl-6-azidohexanoate in an amount ranging from about. 1.5 to 4.0 parts by weight of plasticizer to about 1.0 parts by weight of resinous binder.

4,432,815

AZIDO FLUORODINITRO AMINES

Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 350,494, Feb. 19, 1982. This application Apr. 12, 1983, Ser. No. 484,328
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.3 **4 Claims**

1. A solid composite type propellant composition comprising a cured intimate mixture of:

A. an oxidizer component;

B. a synthetic resinous binder component; and

C. an azido fluorodinitro amine energetic plasticizer.

4,432,816

PYROTECHNIC COMPOSITION FOR CUTTING TORCH

Katherine L. Kennedy; Paul W. Proctor, both of White Plains, and Robert L. Dow, LaPlata, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 9, 1982, Ser. No. 440,482
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.3 **6 Claims**

1. An energetic composition consisting essentially of from about 15 to about 20 weight percent of aluminum, from about 5 to about 10 weight percent of the copolymer of vinylidene fluoride and hexafluoropropylene, and the remainder of iron oxide powder which is substantially ferric oxide.

4,432,817

PROPELLANT CONTAINING AN AZIDONITROCARBAMATE PLASTICIZER

Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1982, Ser. No. 361,643
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.5 **1 Claim**

1. A solid composite type propellant composition comprising a cured intimate mixture of:

A. an oxidizer component consisting essentially of cyclotetramethylene tetranitramine;

B. a synthetic resinous binder component consisting essentially of a polyester resin; and

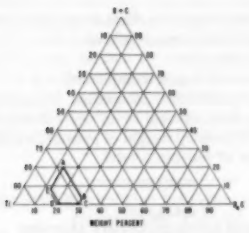
C. 1,3-diazido-2-propyl-N-nitro-N-trinitropropyl carbamate as an energetic plasticizer present in a ratio ranging from about 1.5 to 4.0 parts of plasticizer to about 1.0 part of polyester resin binder.

4,432,818

COMPOSITIONS FOR USE IN HEAT-GENERATING REACTIONS

James R. Givens, Tucson, Ariz., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 22, 1980, Ser. No. 180,269
Int. Cl.³ C06B *43/00*
U.S. Cl. 149—22 **23 Claims**



1. A composition capable of gasless exothermic reaction in the condensed state which includes boron carbide plus at least one reactive metal selected from the group consisting of titanium, zirconium, hafnium and vanadium.

4,432,819

PRIMING COMPOSITION AND TECHNIQUES

George B. Carter, Lichfield, and Alan Cross, Rubery, both of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Sep. 3, 1976, Ser. No. 722,072
Claims priority, application United Kingdom, Sep. 11, 1975, 37386/75
Int. Cl.³ C06B *31/00*
U.S. Cl. 149—45 **11 Claims**

1. A priming composition for an explosive device including a primary explosive which is produced in situ in relation to at least one other element by bringing together components to form a combination including a multiple salt of a hypophosphite which has been permitted to crystallize freely in situ during its formation.

4,432,820

PROCESS FOR PRODUCTION OF POLYESTER-POLYOLEFIN FILM LAMINATES

Kenneth P. Thompson, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 362,665, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 185,778, Sep. 10, 1980, abandoned.
This application Mar. 14, 1983, Ser. No. 475,464
Int. Cl.³ B32B *31/26*
U.S. Cl. 156—82 **8 Claims**

1. A process for producing a permanently bonded laminate comprising polyester and polyolefin layers which consists essentially of:

(A) providing a preformed polyester or a heat-sealable polyolefin film;

(B) contacting a surface of said film with the secondary portion of a flame in the vicinity of the termination of the primary portion of the flame, said flame being produced from a combustible hydrocarbon-oxygen mixture and having a temperature in the range of about 1700° F. to about 1900° F., so as to prime the surface of the film;

(C) storing the primed film; and

(D) coating the stored film with a layer of molten polymer, said molten polymer being a heat-sealable polyolefin when the film is a polyester film and a polyester when the film is a polyolefin.

4,432,821

COMPOSITION AND METHOD FOR BRAZING GRAPHITE TO GRAPHITE

Albert J. Taylor, Ten Mile, and Norman L. Dykes, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1982, Ser. No. 406,829
Int. Cl.³ C03B *29/00*; C04B *33/34, 37/00*
U.S. Cl. 156—89 **7 Claims**

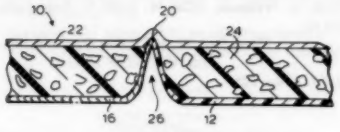
1. A graphite brazing and coating composition comprising a slurry of particulate uranium oxide, particulate hafnium carbide and a thermosetting resin, said composition being characterized by the uranium oxide being converted to uranium dicarbide at an elevated temperature, and being also converted at a higher temperature of about 2600° C. to a liquid phase of the uranium dicarbide and hafnium carbide.

4,432,822

METHOD OF MANUFACTURING UPHOLSTERY PANELS

Ronald W. Adams, Auburn, and Theodore W. Johnson, Monmouth, both of Me., assignors to Albany International Corp., Albany, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,489
Int. Cl.³ B29C *31/00*; B32B *31/06, 31/20*
U.S. Cl. 156—148 **3 Claims**



1. A method of manufacturing an upholstered, decorative, panel having a plurality of diverse, upholstery materials which together form the decorative, upholstered surface, which comprises;

(a) providing a panel base support which comprises;

a core of non-woven, synthetic textile fibers;

a base first layer of heat fusible, synthetic, thermoplastic textile melt fibers;

a base second layer selected from the group consisting of a film of synthetic, polymeric resins and a layer of heat fusible synthetic thermoplastic textile melt fibers;

said first and second layers sandwiching the core, fibers of said first layer and the core being interengaged with each other and with the second layer, said interengagement being of the character obtained by needling;

(b) providing a panel intermediate layer of a synthetic, polymeric resin foam;

(c) providing an outer, surface layer formed from a plurality of diverse sheets of decorative, surface upholstery materials, joined together along seam lines;

(d) assembling the base (a) with the surface layer (c) so as to sandwich intermediate layer (b), leaving at least a portion of the space between base (a) and layer (c) beneath the seam lines, free of layer (b);

(e) providing a mold adapted by size and configuration to receive the assembly, said mold including a means for applying heat and pressure along the seam lines of the surface layer (c) in the zones beneath the seam lines which are free of layer (b) when the assembly is received in the mold;

(f) inserting the assembly in the mold; and

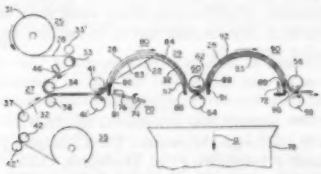
(g) applying heat and pressure on the assembly in the mold; whereby portions of the surface layer (c) are bonded to the base layer (a) in those areas of the panel which are free of the intermediate layer (b).

4,432,823

METHOD AND APPARATUS FOR MANUFACTURING ELASTIC LEG DISPOSABLE DIAPERS

William J. Moore, Winnebago County, Wis., assignor to Kimberly Clark Corporation, Neenah, Wis.

Filed Jun. 29, 1981, Ser. No. 278,753
Int. Cl.³ B32B 31/08
U.S. Cl. 156—164 12 Claims



1. In an apparatus for manufacturing elastic leg disposable diapers including means for continuously moving a web of material in the direction of its length and means for attaching portions of a continuously moving elastic ribbon to the web at predetermined spaced apart locations along the length of the web, said predetermined locations corresponding to the leg areas of the finished diapers, the combination comprising:

means for separating the path of movement of the web and the elastic ribbon between said attached locations;

means comprising at least two members positioned on opposite sides of the path of movement of the elastic ribbon for clamping the elastic ribbon; and

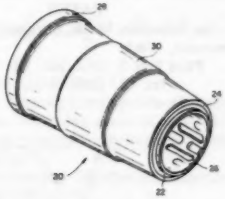
means for cutting the unattached portions of the elastic ribbon between said attached locations while the elastic ribbon is separated from the web and clamped by the clamping means.

4,432,824

METHOD FOR INTERNAL PIPE PROTECTION

Paul M. Cook, Menlo Park; Richard F. Otte, Los Altos Hills; James L. Claypool, Mountain View; Lawrence J. White, San Jose; Harry C. Broyles, Sunnyvale, and Peter L. Brooks, Los Altos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 174,304, Jul. 31, 1980, Pat. No. 4,355,664.
This application Jul. 26, 1982, Ser. No. 402,173
Int. Cl.³ B32B 31/00; F16L 9/14
U.S. Cl. 156—165 4 Claims



1. A method of corrosion protecting the inside section of a pipe comprising the steps of:

placing a heat-activated pipe protection device within the section of the pipe to be protected, said device having a radially expandable delivery means, a heat-deformable corrosion-resistant liner means outside and in contact with said delivery means, and a heat-activatable bonding means outside and in contact with said liner means;

heating the outside of said pipe generally uniformly along the section to be protected, thereby expanding said delivery means, deforming said liner means, and forcing said bonding means radially outwardly progressively into contact with the inside of the pipe, said bonding means flowing progressively between said liner means and the inside of the pipe to preclude air entrapment between said liner means and the inside of the pipe, and bonding said liner means to the inside of said pipe.

4,432,825

METHOD OF MAKING FOAM COMPOSITE MATERIAL IMPREGNATED WITH RESIN

Bengt Andersson, Söraker, and Olof Tanner, Sundsvall, both of Sweden, assignors to Kemanord AB, Stockholm, Sweden

Division of Ser. No. 260,677, May 5, 1981, Pat. No. 4,362,778.
This application Sep. 13, 1982, Ser. No. 417,599
Claims priority, application Sweden, May 21, 1980, 8003776
Int. Cl.³ B32B 31/00
U.S. Cl. 156—307.3 7 Claims

1. A method for the manufacture of a laminate comprising the steps of:

(a) providing a foam composite material including,

(1) a material in the form of a web,

(2) a curable resin in the B-stage, i.e. in a stage between an uncured A-stage in which the resin is meltable, poorly cross-linked and soluble in solvents, and a C-stage in which the resin is not meltable, completely cross-linked and insoluble, and

(3) expanded thermoplastic microspheres, wherein the curable resin and the microspheres are uniformly distributed in the web material,

(b) assembling the foam composite material with at least one further such material or another material and

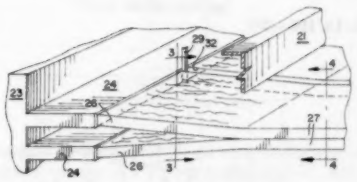
(c) joining the materials by a transition from B-stage to C-stage of the curable resin.

4,432,826

COEXTRUSION METHOD AND APPARATUS

Walter P. Scarberry, St. Charles, and Charles K. Vollman, Elgin, both of Ill., assignors to Health-Ex Corporation, Chicago, Ill.

Division of Ser. No. 222,749, Jan. 5, 1981, Pat. No. 4,353,498.
This application Jul. 26, 1982, Ser. No. 402,080
Int. Cl.³ B29D 7/00; B32B 31/18
U.S. Cl. 156—244.11 26 Claims



1. A method for providing a coextruded film having a tear path with a thickness less than the coextruded film thickness, comprising:

coextruding a plurality of molten extrudates into a zone wherein the multiple extrudates are combined into a multiple ply coextrusion of at least two non-tacky polymer films;

interrupting the extrusion path of at least one of the molten extrudates, said interrupting step preventing extrudate flow at a narrow location in order to form an elongated void in said at least one molten extrudate and in the non-tacky polymer film formed from said molten extrudate, said interrupting being carried out before the multiple extrudates are combined into the multiple ply coextrusion; and

combining said plurality of molten extrudates into a multiple ply coextruded film having at least one tear path at the

location of each elongated void, said tear path having an overall thickness less than the thickness of the coextruded non-tacky film.

4,432,827

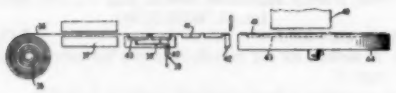
METHOD OF MAKING CASSETTE HOLDERS

Herbert Graetz, Chicago, Ill., and Ronald C. Unterreiner, Cape Girardeau, Mo., assignors to Blair Industries, Inc., Scott City, Mo.

Division of Ser. No. 376,147, May 7, 1982, Pat. No. 4,407,410. This application Apr. 29, 1983, Ser. No. 489,781

Int. Cl.³ B29C 3/04

U.S. Cl. 156—245 17 Claims



1. The method of making a book-style album which comprises thermal forming a thermoplastic sheet to define a plurality of pairs of trays and lids in side-by-side relation connected by flexible spines, covering the bottoms of the trays and lids with rigid slabs, covering the slab-receiving side of the thermoplastic sheet with a second thermoplastic sheet, crimping and bonding the sheets together around the margins thereof, providing tear margins around the crimped bond to facilitate severing of the bonded sheets, and severing the bonded sheets along the tear margins to provide a plurality of book-type holders each with rigid flaps, a tray on one flap, a lid on the other flap, and a flexible spine and spine liner connecting the tray and lid.

4,432,828

METHOD OF AN APPARATUS FOR MOUNTING A FOIL ON A PLATE

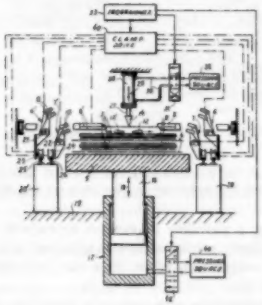
Dieter Siempelkamp, Krefeld, and Wolfgang Götz, Krefeld-Fischeln, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 177,839

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1979, 2932845

Int. Cl.³ B32B 31/04

U.S. Cl. 156—285 8 Claims



1. In a device for assembling a stack of pressed material including a synthetic resin impregnated mat, a press plate and a metal foil, in the formation of laminated board, wherein a cyclically displaceable assembly table is provided, means cooperates with said table for depositing the press plate thereon, means cooperates with the table to deposit said mat upon said press plate, and means cooperates with said table to apply said foil to said mat so that a foil layer is applied to one side of said mat, each of said means operating cyclically in production of pressed board, the improvement which comprises the combination therewith of:

a pair of suction boxes displaceable parallel to the table and having rows of suction openings turned toward each other; and

a bar extending transversely of the direction of displacement of said suction boxes and displaceable relative to said table to press said foil against a surface whereby mutual displacement of said suction boxes away from said bar and from each other applies suction to said foil drawing same against said surface.

4,432,829

ADHESIVE BONDING METHOD

Andrew G. Bachmann, Harwinton, Conn., assignor to American Chemical & Engineering Co., Torrington, Conn.

Division of Ser. No. 156,475, Jun. 4, 1980, Pat. No. 4,348,503. This application Mar. 8, 1982, Ser. No. 355,475

Int. Cl.³ C09J 5/02

U.S. Cl. 156—307.3 12 Claims

1. In a method for the adhesive bonding of two surfaces, the steps comprising:

(1) forming a stable nonanaerobic adhesive composition comprised of: (a) a monomeric acrylic ester capable of free-radical polymerization to produce, upon polymerization thereof, an adhesive solid, (b) a monomer-soluble elastomeric filler material for toughening and/or strengthening the cured adhesive composition, and (c) a latent catalyst system consisting, in amounts based upon the weight of said ester, essentially of about 1 to 10 parts per hundred of an aromatic perester free-radical precursor, about 0.5 to 10 parts per hundred of an organic acid capable of cyclic tautomerism, and up to about 500 parts per million of a soluble compound of a transition metal cure accelerator, said composition being free from any organic hydroperoxide catalyst;

(2) applying said adhesive composition to at least one surface to be bonded;

(3) effecting contact of said one surface with a second surface to be bonded thereto;

(4) activating said perester catalyst to generate free radicals; and

(5) maintaining such contact for a period of time and under such conditions as to effect curing of said adhesive composition.

4,432,830

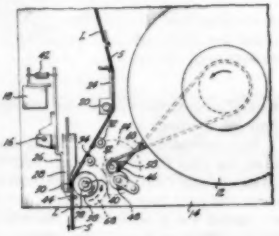
LABEL PRINTER HAVING SELECTABLE LABEL STOCK PATHS

Clifford T. Jue, Edmonds, Wash., assignor to Intermec Corporation, Lynnwood, Wash.

Filed Feb. 7, 1983, Ser. No. 464,206

Int. Cl.³ B65C 9/18, 9/46

U.S. Cl. 156—384 19 Claims



1. In a label printer, a mechanism for providing selectable paths of movement of label stock that consists of a plurality of

labels removably adhering to a front surface of an elongated backing strip, said mechanism comprising: a rotatable drive capstan; a rotatable pinch roller engaging said drive capstan; a rotatable shaft; drive means for rotating said drive capstan and said shaft in opposite directions; a drive roller rotatable about said shaft; clutch means for locking said drive roller to said shaft whenever said shaft is rotated in a given direction and for permitting said drive roller to freely rotate about said shaft whenever said shaft is rotated in an opposite direction; a label stripping pin; and, pressure means yieldably engaging said drive roller;

wherein said aforementioned elements of said mechanism are disposed so that the label stock may be moved in a nonspooling path by threading a free end of the label stock between said drive roller and said pressure means and by causing said drive means to rotate said drive capstan and said drive roller in a first set of opposing directions so that said drive roller is locked to said shaft, whereupon the label stock is pulled by said pressure means and said drive roller and exits without label separation; and,

wherein said aforementioned elements of said mechanism are further disposed so that the label stock may be moved in a self-strip path by further threading the free end of the label stock past said label stripping pin and between said drive capstan and said pinch roller with a rear surface of the backing strip engaging said label stripping pin and with the backing strip being caused to sharply change its direction as it passes over said label stripping pin, and by causing said drive means to rotate said drive capstan and said drive roller in a second set of opposing directions so that said drive capstan and said pressure means pull the label stock and so that said drive roller freely rotates about said shaft, whereupon each label is partially separated from the backing strip as the backing strip passes over said label stripping pin.

4,432,831

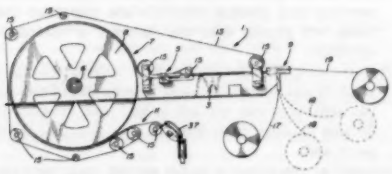
BELT MAKING METHOD AND APPARATUS

Harold Blicher, 5765 Cote St. Luc Rd.; Apt. 214, Hampstead, Quebec, Canada

Filed Sep. 22, 1982, Ser. No. 421,478

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—467 **3 Claims**



1. Apparatus for forming fused seamless belts from an outer covering fabric, an interlining material, and an adhesive for fusing the interlining material to the outer covering fabric, said apparatus comprising:

an input end for bringing together said interlining and said outer covering fabric;

a folding section for folding said outer covering fabric around said interlining material to provide a folded arrangement;

a heating and fusing section for heating said adhesive in said folded arrangement and thereby fusing said outer covering fabric to said interlining material by the application of pressure on the folded arrangement to provide a fused seamless arrangement;

and

an output end for drawing off the fused seamless arrangement;

said folding section having an input end and an output end;

said folding section having a center post including a T-shaped element extending longitudinally of said folding section and having a platform for carrying said outer covering fabric and said interlining material and a separation post;

said center post further including, at said input end, vertically descending flared side walls, the flare of said side walls increasing in the direction of the output end until they are completely horizontal at said output end;

said folding section further including an inner top surface and vertically ascending side walls, said top surface meeting said vertically ascending side walls at a sharp angled junction at said input end, said junction rounding in the direction of said output end and comprising a small arc at said output end, said vertically descending side walls and said vertically ascending side walls merging at said output end and being in parallel arrangement with said inner top surface at said output end; and

said folding section still further comprising, between said input end and said output end, a pair of downwardly descending, inwardly directed, lobes, a lobe angle being defined between each lobe and said top inner surface, said lobe angles decreasing in the direction of said output end, the thickness of said lobe decreasing in the direction of said output end, whereby said lobes disappear at said output end;

whereby said folding section comprises means for providing a double fold of said outer covering fabric on each side of said folded arrangement and underlying said interlining material.

4,432,832

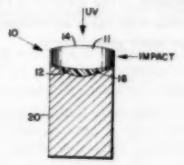
METHOD OF FORMING CONTOURED OPTICAL LAYERS ON GLASS ELEMENTS

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 26, 1982, Ser. No. 411,685

Int. Cl.³ B29C *19/00*; B44C *1/22*; B32B *31/00*; C03C *15/00*

U.S. Cl. 156—630 **6 Claims**



1. A method for forming an optical layer having a predetermined surface contour over a given surface area of a transmissive optical element to change the optical performance characteristics of the optical element, aid method comprising the steps of:

forming a tool having a shape that varies in accordance with the point to point difference in thickness between the optical element given surface area and the optical layer predetermined surface contour plus a predetermined uniform thickness value such that said shape of said tool is the complement so that of said layer predetermined surface contour;

coating at least said surface of said tool with at least one release layer having a thickness equal to said predetermined uniform thickness value;

covering said tool surface with an optically clear epoxy that is curable in the presence of ultraviolet radiation and has a predetermined index of refraction;

aligning said tool with the optical element given surface area and firmly pressing said tool and said optical element given surface area together to center one with the other;

exposing said epoxy to ultraviolet radiation until said epoxy hardens over the optical element given surface area; and separating said tool and the optical element whereby said optical layer releases from said tool with said release layer adhered to it and then chemically removing any of said release layer from the surface of said optical layer.

4,432,833

PULP CONTAINING HYDROPHILIC DEBONDER AND PROCESS FOR ITS APPLICATION

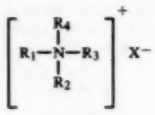
John A. Breese, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 150,885, May 19, 1980, abandoned. This application Feb. 25, 1982, Ser. No. 352,399

Int. Cl.³ D21H *3/12*

U.S. Cl. 162—158 **10 Claims**

1. A wood pulp consisting essentially of a hydrophilic debonder having the general formula:



wherein:

R_1=methyl, ethyl, propyl, hydrogen or hydroxyethyl,

R_2=methyl, ethyl, propyl or $(\text{ethylene oxide})_n$ where n=1 to 50,

R_3=aliphatic chain of at least 4 carbon items,

R_4=$(\text{ethylene oxide})_n$ or $(\text{propylene oxide})_n$ with n=1 to 50,

X=Cl, I, Br, SO_4, PO_4, CH_3CO_2

said debonder present at the level of 0.1% to 5.0% by weight of the dry cellulosic material in an amount sufficient to increase the water and/or urine absorbency.

4,432,834

ADDITIVE FOR FELTED CELLULOSE FIBERS

Joyce M. Whitfield, Chicago, and David R. Cosper, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 954,478, Oct. 25, 1978, abandoned. This application Apr. 11, 1980, Ser. No. 139,176

Int. Cl.³ D21H *3/12*

U.S. Cl. 162—158 **13 Claims**

1. A composition suitable for addition to cellulosic fibers prior to felting them into a tissue sheet comprising as component (a) a monomeric water soluble diallyl dimethyl ammonium halide or homopolymer thereof or mixtures thereof and as component (b) 1-stearamidoethyl-1-methyl-2-heptadecyl imidazolinium methosulfate, the proportions of (a) and (b) being sufficient to enhance softness of the dried sheet while increasing or not substantially reducing absorbency of water and tensile strength of the dried sheet when said composition is added to a slurry of cellulosic fibers prior to felting them into a sheet and thereafter drying said sheet, the weight ratio of component (a) to component (b) in said composition being within the range of 4:1 to 1:4.

4,432,835

METHOD AND AN APPARATUS FOR THE FEEDING OF A FIBRE SUSPENSION ONTO THE WIRE OF A WEB FORMER

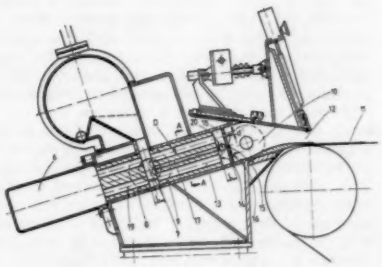
Tapio Waris, Kyminlinna, and Sven-Eric E. Lindroos, Karhula, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Feb. 22, 1982, Ser. No. 351,156

Claims priority, application Finland, Apr. 7, 1981, 811065

Int. Cl.³ D21F *1/06*

U.S. Cl. 162—212 **9 Claims**



1. A method of feeding a fibre suspension onto the wire of a web former, which comprises:

(a) letting the fibre suspension flow through a guiding device consisting of a plurality of parallel guiding channels, said guiding channels having discharge openings of circular cross section, said guiding channels being connected to a slice chamber which is coaxial with said guiding device and downstream thereto and which leads to a slice and extends across the wire of the web former, the distance between said guiding channels and said slice chamber being not greater than the diameter of said discharge openings;

(b) separating the outer parts and the core parts of the jets of stock of said fiber suspension flowing out of said guiding channels from one another in said slice chamber by deflecting the outer parts from the flow direction of the core parts; and

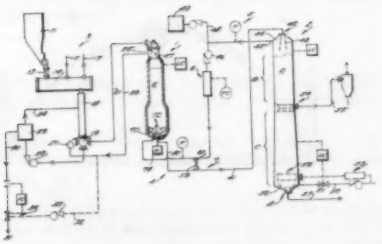
(c) causing the pressure in the second space between said discharge openings of the guiding channels and the slice chamber to rise above the pressure in the first space upstream of said guiding device, whereby said outer parts of the jets of stock are discharged from said second space and returned to said first space.

3. An apparatus for feeding a fibre suspension onto a wire of a web former which comprises first means for introducing the fiber suspension to a guiding device, said guiding device comprising a plurality of parallel guiding channels having first discharge openings of circular cross section, a slice chamber connected to said guiding device and coaxial thereto, said slice chamber leading to a slice which extends across the wire, the distance between said slice chamber and said discharge openings being not greater than the diameter of said first discharge openings, second means coaxial with said guiding channels and arranged downstream thereto for deflecting the outer parts of the jets of stock of said fiber suspension from the flow direction of the core parts of the jets of stock and for returning said outer parts to a point upstream of said guiding device.

4,432,836
VESSEL FALSE BOTTOMING

Michael I. Sherman, Glens Falls, N.Y., and Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,189
Int. Cl.³ D21C *7/00, 7/08*
U.S. Cl. 162—237 **6 Claims**



1. A pressured upright generally cylindrical vessel for treating cellulosic chips material or the like on a continuous basis, said vessel comprising

an inlet for chips material or the like in a top portion thereof;

an outlet for chips material or the like in a bottom portion thereof;

a false bottom disposed therewithin just above said bottom portion to define a bottom volume of the vessel between said bottom portion and falst bottom;

a scraper;

means for mounting said scraper just above said false bottom for rotation about a vertical axis;

means defining an opening in the middle of said false bottom for providing for the passage of chips material or the like under the influence of said scraper from above said false bottom into said vessel bottom volume;

means for introducing liquid under pressure into said vessel bottom volume for entraining chips material or the like passing into said bottom volume and flushing said chips material or the like out said outlet;

means defining a flow path through said opening in said false bottom into said volume that is circular in cross-section and concentric with said vessel; and

wherein said means for mounting said scraper includes a shaft extending through said flow path concentric therewith; and wherein said means defining said flow path includes a conical member extending downwardly from said false bottom opening and flaring outwardly, and a truncated conical shroud surrounding said shaft and having the smallest diameter portion thereof disposed substantially at the top of said conical flow-path defining member and having the largest diameter portion thereof disposed just below said conical flow-path defining member.

4,432,837
SOLVENT RECOVERY PROCESS

Willy Braun, East Brighton, Australia, assignor to Dulux Australia Ltd., Victoria, Australia

Continuation-in-part of Ser. No. 176,760, Aug. 11, 1980, abandoned. This application Jul. 13, 1982, Ser. No. 397,693
Claims priority, application Australia, Aug. 10, 1979, PD9981
Int. Cl.³ B01D *3/34*
U.S. Cl. 203—37 **4 Claims**

1. A process of recovering organic solvent from a liquid waste product comprising an organic solvent in which polymeric material is dispersed or dissolved which waste product is heat convertible by the steps of

(a) dispersing the liquid waste product in particulate form in water in the presence of an effective amount of an inorganic suspending agent to prevent agglomeration of said waste product, said suspending agent selected from the group consisting of bentonite, and activated clays of the hectorite type;

(b) heating the dispersion to boiling point to strip off steam and organic solvent vapour;

(c) condensing the evolved steam and organic vapour and separating the water therefrom; and

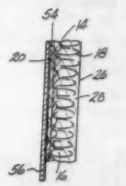
(d) recovering the residue as an aqueous freeflowing slurry of solid granule particles,

said liquid waste product being further characterised in that a film of the liquid waste not more than 2 mm thick when heated in air at 100° C. for 60 minutes yields a residue insoluble in acetone.

4,432,838
METHOD FOR PRODUCING RETICULATE ELECTRODES FOR ELECTROLYTIC CELLS

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 146,558, May 5, 1980, Pat. No. 4,350,580, which is a continuation-in-part of Ser. No. 143,970, Apr. 25, 1980, Pat. No. 4,370,214. This application Jul. 2, 1982, Ser. No. 394,756
Int. Cl.³ C25D *1/08, 5/02*; C25B *9/00, 11/03*
U.S. Cl. 204—11 **12 Claims**



8. A method for producing a reticulate electrode for use in the electrolysis of aqueous solutions of ionic compounds which comprises:

(a) affixing filaments to a support fabric to form a network of filaments,

(b) attaching to said network of filaments a current distributor comprised of an electrically conductive fabric having a front side comprised of a plurality of electrode-engaging means projecting from said front side for attachment to said network of filaments and a substantially planar back side suitable for attachment to an electrical conductor,

(c) depositing by electroplating an electroconductive metal on said network of filaments and said current distributor, said deposition forming metal coated filaments and providing interfilament bonding at contact sites between adjacent filaments, and

(d) removing said support fabric from said metal coated filament network to produce a reticulate electrode having a porosity of at least about 80 percent.

4,432,839
METHOD FOR MAKING METALLIDED FOILS

George A. Kline, Madison, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 18, 1981, Ser. No. 274,822
Int. Cl.³ C25D *1/04, 3/66, 5/10*
U.S. Cl. 204—12 **14 Claims**

1. A process for applying an interdiffused metal coating to a conductive substrate selected from the group of boron, molybdenum, silicon, tungsten, niobium, graphite, technetium, rhenium, the platinum group metals, electrically conductive ceramics and mixtures thereof comprising the steps of:

applying a base metal coating to the substrate;

applying a second metal to the coated substrate using a

measurable quantity of electrical current at a rate temperature to produce interdiffusion between the base metal and the second metal but not between the substrate and the metals.

2. A method for producing metal alloy foil comprising the steps of:

applying to an electrically conductive substrate a coating of a base metal;

applying at least partially under impetus of a measurable electrical current, a coating of a second metal at a temperature and an electrical current flow rate whereby substantial interdiffusion occurs between the coating metals but not between the coating metals and the substrate; and

stripping the resulting interdiffused metal coating from the substrate.

4,432,840

PREVENTION OF POLYMER BUILDUP IN POLYMERIZATION REACTORS USING THIN ORGANIC COATINGS BY ELECTROLYSIS OF PHENOL

Shung-Chung Liau; Wei-Min Cheng, and Uen-Long Young, all of Kaohsiung, Taiwan, assignors to Formosa Plastics Corporation, China

Filed Apr. 26, 1982, Ser. No. 372,076
Int. Cl.³ C25D *7/04*
U.S. Cl. 204—14 N **23 Claims**

1. A method for substantially preventing the buildup of polymers on the internal surfaces of polymerization reactors comprising dissolving an electrolytically formed phenolic polymer in a strongly alkali solvent to form an alkali solution and coating the internal surfaces of the polymerization reactors with said alkali solution.

4,432,841

PREPARATION OF CHALCOGENIDE ALLOYS BY ELECTROCHEMICAL COREDUCTION OF ESTERS

Santokh S. Badesha, Ontario; Thomas W. Smith, Penfield, both of N.Y., and Rafik O. Loutfy, Ontario, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1983, Ser. No. 509,550
Int. Cl.³ C25B *1/00*
U.S. Cl. 204—14 N **21 Claims**

1. A process for preparing chalcogenide alloys of high purity which comprises providing a mixture of the corresponding pure esters of the elements desired in an organic medium, and an organic salt, and simultaneously coreducing the esters by an electrochemical reduction in an electrolytic appartus.

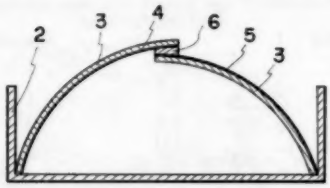
4,432,842

PROCESS FOR PRODUCING TIN-FREE STEEL

Tsuneo Inui, Tokuyama; Hitoshi Kuroda, Kudamatsu; Kenji Hizuka, Kudamatsu; Fumio Kunishige, Kudamatsu, and Yoshikazu Kondo, Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 62,890, Aug. 1, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 323,986
Claims priority, application Japan, Mar. 30, 1979, 54-37084
Int. Cl.³ C25D *11/38*
U.S. Cl. 204—41 **4 Claims**

1. In a process for preparing a tin-free steel which can be used in manufacturing nylon-adhered can bodies to be subjected to a canning process which includes hot-packing or a pasteurization step, said tin-free steel having a layer of metallic chromium on a steel base and a layer of hydrated chromium oxide on said metallic chromium layer, in two electrolytic stages, which process comprises a first electrolytic stage of forming said metallic chromium layer in a first aqueous electrolytic solution, immersing the thus treated steel in said first aqueous electrolytic solution to dissolve hydrated chromium oxide formed on said metallic chromium layer during said first stage, and a second electrolytic stage of forming said hydrated chromium oxide layer in a second aqueous electrolytic solution, each of said first and second solutions consisting of chromic acid and an addition agent, the improvement wherein the addition agent for each of said first and second solutions is a fluorine compound alone, and the amount of said addition agent incorporated in said hydrated chromium oxide layer during said second electrolytic stage is restricted in a manner such that the atomic ratio of sulfur in said hydrated chromium



oxide layer to the total of chromium, oxygen, sulfur and fluorine in said hydrated chromium oxide layer does not exceed 2.5% and the atomic ratio of fluorine in said hydrated chromium oxide layer to the total of chromium, oxygen, sulfur and fluorine in said hydrated chromium oxide layer does not exceed 10%.

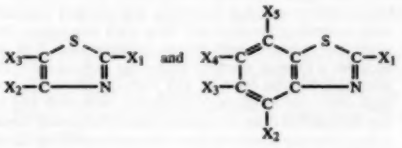
4,432,843

TRIVALENT CHROMIUM ELECTROPLATING BATHS AND PROCESSES USING THIAZOLE ADDITION AGENTS

Robert A. Tremmel, Woodhaven, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Jul. 29, 1982, Ser. No. 403,196
Int. Cl.³ C25D *3/06*
U.S. Cl. 204—51 **26 Claims**

1. An aqueous acidic trivalent chromium electrolyte containing trivalent chromium ions, a complexing agent for maintaining the trivalent chromium ions in solution, halide ions and a bath soluble additive agent present in an amount to increase the tolerance of the electrolyte to the presence of deleterious contaminating metal ions, said additive agent being of the structural formula:



wherein:

X_1–X_5 are the same or different and are H, NH_2, CH_3, NO_2, halide, C_1–C_6 alkyl sulfonate, C_1–C_6 alkyl carboxylate, C_1–C_6 alcohol, S—R; in which R is H, C_1–C_6 alkyl sulfonate, C_1–C_6 alkyl carboxylate, C_1–C_6 alkyl alcohol.

4,432,844

PROCESS FOR REGENERATION OF ELECTROLYTE CONTAINING TIN SALTS BY REDUCING THE SAME

Yuji Hinoda, and Kazuhiro Enmoto, both of Kawasaki, Japan, assignors to Fujisash Company, Kawasaki, Japan

PCT No. PCT/JP80/00141, § 371 Date Jan. 28, 1982, § 102(e) Date Jan. 28, 1982, PCT Pub. No. WO82/00036, PCT Pub. Date Jan. 7, 1982
PCT Filed Jun. 23, 1980, Ser. No. 348,050
Int. Cl.³ C25D *21/18*
U.S. Cl. 204—54 R **4 Claims**

1. A process for regenerating a stannous tin-containing electrolyte which contains stannic ions comprising

if said electrolyte is not acidic, adding sufficient acid to said electrodlyte so that the electrolyte becomes acidic;

adding metallic tin having a high specific surface area selected from the group consisting of powdered tin, thin foils of tin, and sponge-like tin to said electrolyte; and

heating said electrolyte containing said added metallic tin to from 80° C. to the boiling temperature of said electrolyte whereby stannic ions are reduced to stannous ions and metallic tin is oxidized to stannous ions thereby regenerating the electrolyte.

4,432,845

METHOD OF PRODUCING TIN-FREE STEEL SHEETS HAVING IMPROVED RESISTANCE TO RETORTING TREATMENT

Hajime Ogata; Toshio Ichida; Shunichi Tsugawa, and Toshio Irie, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 14, 1983, Ser. No. 513,662

Claims priority, application Japan, Jul. 20, 1982, 57-126042

Int. Cl.³ C25D *5/02, 11/38*

U.S. Cl. 204—56 R **1 Claim**

1. A method of producing a tin-free steel sheet having thereon a plating of metallic chromium ranging from 50 to 200 mg per square meters and a coating of hydrated chromium oxides ranging from 5 to 30 mg per square meters on the metallic chromium plating surface and exhibiting improved retorting resistance, comprising the steps of

chromium plating a steel sheet through cathodic electrolysis in a chromium ion-containing aqueous solution to form a plating consisting essentially of metallic chromium,

reversely electrolyzing the chromium plated steel sheet by a successive anodizing treatment in said aqueous solution, and

subjecting the reversely electrolyzed steel sheet to an electrolytic chromate treatment in another aqueous solution containing sulfuric acid and at least one selected from the group consisting of chromic acid, chromates, and dichromates,

the improvement wherein said aqueous solution used in the electrolytic chromate treatment has a sulfate concentration limited to the range of 0.01 to 0.10 gram per liter of the solution.

4,432,846

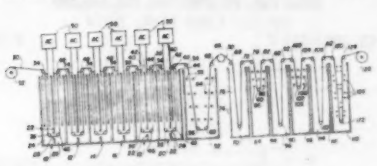
CLEANING AND TREATMENT OF ETCHED CATHODE ALUMINUM CAPACITOR FOIL

LeRoy Honeycutt, III, Salisbury, N.C., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1982, Ser. No. 448,817

Int. Cl.³ C25F *3/04, 1/00;* **C23G** *1/02;* **B08B** *3/00*

U.S. Cl. 204—129.95 **17 Claims**



12. In a process for producing cathode aluminum capacitor foil in which a running length of aluminum foil of about 98.0% to about 99.99% pure aluminum is electrolytically etched in a liquid electrolyte comprising hydrochloric acid, nitric acid and phosphoric acid in water solution while applying an electric current to electrodes immersed in the electrolyte solution in spaced relation to the foil, the improvement comprising the steps of

water washing the running length of foil promptly upon withdrawal from the electrolyte solution to remove electrolyte solution and chlorides produced in the electrolytic etching process from the surface of the foil,

passing the rinsed, etched foil through a first post etch treatment bath comprising an aqueous solution of nitric acid,

rinsing the nitric acid solution from the surface of the foil promptly upon withdrawing the foil from the first post etch treatment bath,

passing the washed foil through a second post etch treatment bath comprising an aqueous solution of chromic acid and phosphoric acid, and

rinsing the chromic acid and phosphoric acid solution from the surface of the foil promptly upon withdrawal from the second post etch treatment bath.

4,432,847

POLY SULFOXIDES FROM 1,3,4-THIADIAZOLE-2,5-DITHIOL

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1976, Ser. No. 709,780

Int. Cl.³ C07D *285/12, 417/12, 417/14*

U.S. Cl. 204—158 R **19 Claims**

1. A poly sulfoxide selected from the group consisting of: 2,5-bis(1-t-octylthiomethylsulfoxy)-1,3,4-thiadiazole; 2-(1-t-octylthiomethylsulfoxy)-5-(1-t-octylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-octylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-dodecylthiomethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-dodecylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-hexadecylthiomethylsulfoxy)-1,3,4-thiadiazole; 2-(1-t-hexadecylthiomethylsulfoxy)-5-(1-t-hexadecylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-hexadecylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-hexadecylthio-1-hexylmethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-t-hexadecylsulfoxy-1-hexylmethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-octylthiomethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(1-octylsulfoxymethylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(β-hydroxy-β-phenylethylsulfoxy)-1,3,5-thiadiazole; 2,5-bis(β-hydroxyoctyl-4-sulfoxy)-1,3,4-thiadiazole; 2,5-bis(β-hydroxydodecylsulfoxy)-1,3,4-thiadiazole; 2,5-bis(β-hydroxy-β,4-pyridylethylsulfoxy)-1,3,4-thiadiazole and 2,5-bis(β-hydroxy-β,2-pyridylethylsulfoxy)-1,3,4-thiadiazole

19. A process for preparing polysulfoxides which comprises the selective oxidation of the reaction product of 1,3,4-thiadiazole-2,5-dithiol (DMTD) and an olefinicaly unsaturated compound wherein the said olefinically unsaturated compound is selected from the group of olefinically unsaturated compounds consisting of styrene, α-methylstyrene, α-p-dimethylstyrene, allylbenzene, cyclohexene, 1-vinylcyclohexene, ethylene, propylene, 1-butene, 1-octene, 1-dodecene, 1-octadecene, 2-vinylpyridine, 4-vinylpyridine, 2-vinylthiophene, 4-chlorostyrene, 4-nitrostyrene, eugenol methyl ether and 4-dimethylaminostyrene, wherein said DMTD is in the mole ratio to the olefinicaly unsaturated compound of 2:1 to 5:1 at a temperature within the range from about 0° C. to 40° C. with oxygen at 5–200 psig for 0.5 to 150 hours, and actinic radiation in the presence of a dye sensitizer selected from the group consisting of methylene blue, Eosine, and Rose Bengal.

4,432,848

RADIATION CURED, HIGH TEMPERATURE PRESSURE-SENSITIVE ADHESIVE

Ralf Korpman, Bridgewater, N.J., assignor to Permacel, New Brunswick, N.J.

Filed Nov. 19, 1981, Ser. No. 322,626

Int. Cl.³ C08L *53/02*

U.S. Cl. 204—159.17 **6 Claims**

1. An adhesive possessing good solvent resistance and high temperature cohesive strength prepared by high energy radiation curing of an adhesive composition comprising

(a) an elastomer component comprising an A-B block copolymer wherein A represents a poly(alkenylarene) block and B represents a polyisoprene block,

(b) a tackifier resin component comprising a polyisoprene block compatible tactifier resin, said resin being employed

in an amount of from about 50 to 100 parts by weight for 100 parts by weight of the elastomer component, and

(c) a coupling agent component, said coupling agent component being an acrylic or a methacrylic acid ester of a di- to tetra-functional polyol, in an amount of from about 5 to 25 parts by weight per 100 parts by weight of the elastomer component.

4,432,849

METHOD AND APPARATUS FOR SEPARATING MACROMOLECULES OR PARTICLES IN A LIQUID SOLUTION

Takayasu Saito, Tokyo, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,133

Claims priority, application Japan, Jul. 9, 1982, 57-120159

Int. Cl.³ G01N *27/26, 33/16*

U.S. Cl. 204—180 R **6 Claims**

1. A method of separating particles in a solution, comprising the steps of applying a centrifugal force to the solution in one direction and simultaneously subjecting the solution to a force imposed in a direction opposite to said one direction by an electric field applied, thereby separating the particles into a position in which said centrifugal force counterbalances said force imposed by the electric field.

4,432,850

UNGELLED POLYEPOXIDE-POLYOXYALKYLENEPOLYAMINE RESINS, AQUEOUS DISPERSIONS THEREOF, AND THEIR USE IN CATIONIC ELECTRODEPOSITION

Thomas C. Moriarity, Allison Park, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 284,865, Jul. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,463

Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 C **10 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode and an anode immersed in an aqueous resinous dispersion, comprising passing electric current between the anode and the cathode to cause a coating to deposit on the cathode, wherein the aqueous resinous dispersion contains from:

(A) 0.5 to 40 percent by weight of an ungelled resin formed from reacting:

(i) a polyepoxide with

(ii) a polyoxyalkylenepolyamine; the ratio of equivalents of active hydrogens in (ii), with primary amine groups being considered monofunctional, to equivalents of epoxy in (i) being within the range of 1.20 to 1.70:1;

the reaction product being at least partially neutralized with acid to provide cationic groups,

(B) 60 to 99.5 percent by weight of an additional cationic resin different from (A) and which is electrodepositable on a cathode;

the percentages by weight being based on total weight of (A) plus (B).

4,432,851

ELECTRODEPOSITION OF LUBRICATIVE COATING

Sachio Matsuo, Takatsuki; Tadashi Sakane, Amagasaki; Ryoichi Noumi, Minoo; Shinji Fujiwara; Hiroshi Fukudome, both of Ibaraki; Rikizo Kobashi, Tokyo; Hiroumi Izaiku, Nishinomiya, and Toshinari Yazawa, Yokohama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Nippon Oil & Fats Co., Ltd., Tokyo, both of, Japan

Filed Nov. 10, 1982, Ser. No. 440,525

Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 R **6 Claims**

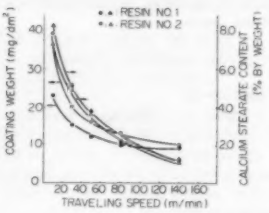
1. A method of applying electrodeposition coating onto metallic material by continuously passing the metallic material through an electrodeposition bath comprising an alkaline-solution soluble resin, a solid lubricant and water, characterized in that the bath temperature is not lower than 35° C., the bath voltage applied is not lower than 60 V and the electrodeposition is carried out under the conditions defined by the following equation:

$$aB+bT-cS \geq 3$$

(a=0.40–0.70, b=0.50–1.00 and c=0.010–0.020)

where "B" stands for the weight percent of the solid lubricant based on the solids content of said electrodeposition bath;

"T" stands for the electrodeposition treating time in seconds; and



"S" stands for the travelling speed in meters per minute (m/min) of the metallic material through the electrodeposition bath,

wherein said alkaline-solution soluble resin comprises 40–95% by weight of the solids content of the bath and is a salt of a copolymer having a glass transition temperature of −10° C. to 35° C. and a number-average molecular weight of 5,000–50,000, said copolymer comprising 5–30% by weight of acrylic acid, methacrylic acid or a mixture thereof and 70–95% by weight of an acrylate or methacrylate ester of a monovalent aliphatic C_1–C_8 alcohol or a mixture thereof, and said solid lubricant comprises 5–60% by weight of the solids content of the bath and is a water-dispersible organic metal soap having a particle size of from 0.1 to 10μ.

4,432,852

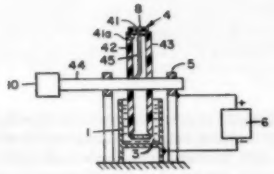
METHOD AND APPARATUS FOR PRODUCING MICA FILM

Francis P. Fehlner, and William J. Wein, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 18, 1982, Ser. No. 350,289

Int. Cl.³ C25D *13/02, 13/14*

U.S. Cl. 204—181 F **4 Claims**



1. In the method of producing mica film by the electrophoretic deposition of mica particles from a fluid mica sol onto an electrode surface to form a mica film and the subsequent removal of the film from the surface as cohesive mica film, the improvement wherein the electrode surface consists of a glass which is covered with an electrically conductive antimony-doped tin oxide coating.

4,432,853

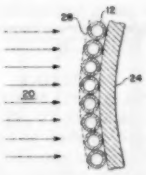
METHOD OF MAKING AN ION BEAM SPUTTER-ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT

Bruce A. Banks, Olmsted Township, Cuyahoga County, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 272,407, Jun. 10, 1981, Pat. No. 4,377,169. This application Nov. 24, 1982, Ser. No. 444,124

Int. Cl.³ A61B *27/00*

U.S. Cl. 204—192 E 17 Claims



1. In a method of making a ventricular catheter for controlling the condition of hydrocephalus by relieving the excessive cerebrospinal fluid pressure comprising the steps of

covering at least one end portion of each of a plurality of microtubular members with a mask having a plurality of microscopic openings therein,

placing said covered microtubular members in a vacuum environment, and

exposing said mask to a beam of ions whereby perforations are produced in said end portions of said microtubular members.

4,432,854

WEB CONVEYING METHOD AND APPARATUS

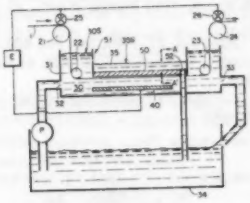
Masahiro Takahashi; Toshio Hagiwara; Tsutomu Kakei, and Kazutaka Oda, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara

Filed Feb. 27, 1981, Ser. No. 238,909

Claims priority, application Japan, Feb. 29, 1980, 55-24773

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—206 26 Claims



1. A web conveying apparatus comprising:

an electrolytic bath;

an electrode;

means for conveying a web through said electrolytic bath so that a first face of said web travels adjacent said electrode;

means for supporting an opposite face of said web as said web is conveyed through said electrolytic bath, said supporting means comprising a guide plate having a plurality of through-holes formed therein; and

means for applying a static pressure to said web in said electrolytic bath to press said web against a first side of said guide plate to keep said first face of said web adjacent said electrode, said static pressure applying means comprising means for maintaining a static electrolytic solution fluid pressure of said bath adjacent said first side of said supporting means higher than a static electrolytic solution fluid pressure of said bath adjacent a second side of said supporting means which is opposite said first side so that electrolytic solution flows from said first side to said second side through said through-holes.

4,432,855

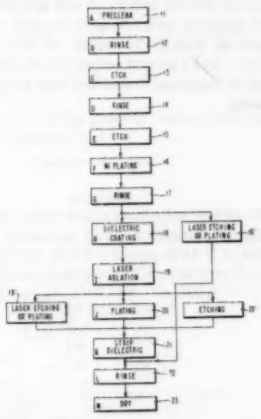
AUTOMATED SYSTEM FOR LASER MASK DEFINITION FOR LASER ENHANCED AND CONVENTIONAL PLATING AND ETCHING

Lubomyr T. Romankiw, Briarcliff Manor, and Robert J. von Gutfeld, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,657

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—207 15 Claims



1. In an energy beam enhanced electrochemical system for treating a substrate electrochemically, the improvement comprising;

application of a protective film to the work to be treated electrochemically, formation of a mask on said substrate with an energy beam, and

performing of said treatment electrochemically.

4,432,856

APPARATUS FOR MANUFACTURING CHLORINE DIOXIDE

Katsuyuki Murakami, Maebashi; Kaoru Hirakata, Yoshioka; Fumio Ishizaka, Maebashi; Shinichi Shimoda, Fujimi, and Reiichi Itai, Maebashi, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,545

Claims priority, application Japan, May 13, 1980, 55-63121

Int. Cl.³ C25B *15/00*

U.S. Cl. 204—237 16 Claims

1. An apparatus for producing chlorine dioxide by the electrolysis of a chlorite solution which comprises:

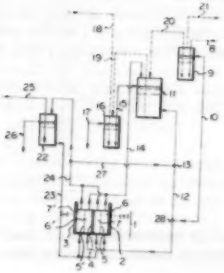
an electrolytic cell for producing chlorine dioxide by electrolysis of a solution of chlorite, said electrolytic cell including an anode compartment and a cathode compartment, said electrolytic cell including means for discharging anolyte from said anode compartment and means for discharging catholyte from said cathode compartment;

a supply tank having a first input for receiving an aqueous fresh chlorite solution, a first output for supplying a chlorite containing solution, a second input for receiving a mixture of chlorine dioxide and air and a second output

for removing a mixture of chlorine dioxide and air from the system;

a stripping tank having a first output for supplying an anolyte to the anode compartment of said electrolytic cell, a first input coupled to the anode compartment of said electrolytic cell for receiving anolyte containing chlorine dioxide dissolved therein, a second input for receiving a mixture of chlorine dioxide and air, said stripping tank stripping some of said anolyte of chlorine dioxide by said air contained in said mixture supplied thereto, a second output for supplying anolyte containing dissolved chlorine dioxide to an auxiliary stripping tank, and a third output for supplying a mixture of chlorine dioxide and air to said supply tank;

said auxiliary stripping tank including a first input for receiving anolyte from said stripping tank, a second input for receiving fresh air, a first output for supplying a mixture of chlorine dioxide and air to said stripping tank, said auxiliary stripping tank stripping anolyte of chlorine dioxide dissolved therein by means of said fresh air supplied thereto, and a second output for discharging a part of the anolyte contained in said auxiliary stripping tank from the system;



a circulation tank coupled to the cathode compartment of said electrolytic cell and including a first input for receiving a first portion of said catholyte discharged from said cathode compartment, a second input for receiving a diluent to dilute the catholyte and to thereby control the alkali concentration of the catholyte in said circulation tank, a first output for supplying diluted catholyte to the cathode compartment of said electrolytic cell, and a second output for discharging a part of the catholyte contained in said circulation tank from the system;

means for supplying a second portion of the catholyte discharged from said cathode compartment to said first output of said stripping tank;

means for combining said second portion of said catholyte and said anolyte from said first output of said stripping tank to form a first mixture; and

means for combining said first mixture with said chlorite containing solution provided at said first output of said supply tank to thereby form a second mixture, and means for supplying said second mixture to said anode compartment of said electrolytic cell.

4,432,857

CLADDING CATHODES OF ELECTROLYTIC CELL WITH DIAPHRAGM OR MEMBRANE

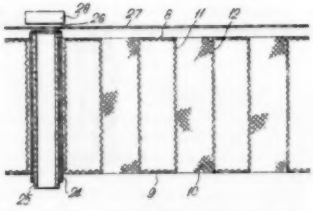
Colin S. Stanier, Northwich, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 1, 1982, Ser. No. 353,419

Claims priority, application United Kingdom, Mar. 10, 1981, 8107502

Int. Cl.³ C25B *9/00, 11/03;* **B29H** *5/26;* **B29C** *19/04*

U.S. Cl. 204—253 **14 Claims**



1. A method of cladding a separator to a cathode box of the pocket type for use in an electrolytic cell, the cathode box comprising side walls, a top and bottom, and a plurality of pockets substantially parallel to each other and formed by foraminate walls positioned between the top and bottom, characterised in that a separator in the form of a sleeve is positioned in each pocket of the cathode box with the ends of the sleeves projecting beyond the ends of the pockets, a first sheet material is placed in contact with those parts of the sleeves projecting beyond the ends of the pockets in one direction and the sleeves are sealed to the sheet material, a second sheet material is placed in contact with those parts of the sleeves projecting beyond the ends of the pockets in the opposite direction and the sleeves are sealed to the second sheet material, and those parts of the sheet materials adjacent to the ends of the pockets are removed.

4,432,858

MONOPOLAR FILTER-PRESS TYPE ELECTROLYZER

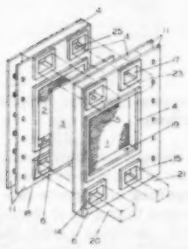
Helmut Schmitt, Eintrachtstr. 28, 4600 Dortmund 1; Helmuth Schurig, Jahnstr. 26, 4755 Holzwickede, and Bernd Strasser, Freiligrath-Str. 6, 4700 Hamm Westf., all of Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,312

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130742

Int. Cl.³ C25B *9/00, 11/03*

U.S. Cl. 204—257 **6 Claims**



1. A monopolar filter-press type electrolyzer for the production of an aqueous alkali hydroxide solution, halogen, and hydrogen from an aqueous halogenide-bearing electrolyte; the electrolyzer comprising: two end plates; a plurality of alternat-

ing anolyte and catholyte chambers each formed by two anode and two cathode plates and seals extending around the perimeters of the plates; a membrane permeable to ions separating the chambers; said seals having portions extending between the chambers for mounting said membrane and insulating said anode and cathode plates from each other; said anode plates, cathode plates, and seals having orifices which constitute inlet and outlet ducts for process fluids when said plates, membranes, and seals are assembled; each said anolyte and catholyte chamber including two anode and cathode plates having an active part permeable to gas and liquids, an inactive part impermeable and including at least four bores, said bores and said seals covering the inactive part of said anode and cathode plates and including at least four passages.

4,432,859

DIAPHRAGM FOR WATER ELECTROLYSIS

Knut A. Andreassen, Rådyrv. 77, 3900 Porsgrunn; Olav A. Eide, Villavn. 30, 3660 Rjukan, both of Norway, and Gerhard Beyer, c/o Hoechst Aktiengesellschaft, Postfach 80 03 20, 6320 Frankfurt Am Main 80, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,485

Claims priority, application Norway, Jun. 16, 1981, 812027

Int. Cl.³ C25B *1/46, 13/08*

U.S. Cl. 204—296 **3 Claims**

1. A diaphragm suitable for use in a water electrolysis cell, which consists essentially of a woven fabric of monofilaments of a fluorocarbon polymer, only the surface of said monofilaments being oxidized, the permeability of said diaphragm for gas in a dry state being from 50 to 1000 $l.dm^{-2}.min^{-1}$ at a pressure difference of 200 Pa.

4,432,860

POROUS DIAPHRAGM FOR ELECTROLYTIC CELL

Jean Bachot, Fontenay aux Roses, and Jean Grosbois, L'Isle Adam, both of France, assignors to Chloe Chimie, Puteaux, France

Filed May 14, 1982, Ser. No. 378,222

Claims priority, application France, May 15, 1981, 81 09688

Int. Cl.³ C25B *13/08*

U.S. Cl. 204—296 **20 Claims**

1. A porous diaphragm adapted for use in an electrolytic cell, said diaphragm comprising an electrolytically acceptable porous sheet member having a total pore volume and average equivalent pore diameter adapted for electrolysis, and having an ion exchange resin fixedly deposited within the pores and occupying from 8 to 30% of the total pore volume thereof.

4,432,861

FEED MIXING CHUTE AND PACKED BED FOR PYROLYZING HYDROCARBONACEOUS SOLIDS

P. Henrik Wallman, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 17, 1983, Ser. No. 475,999

Int. Cl.³ C10G *1/00*

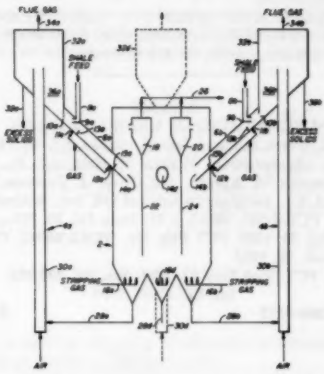
U.S. Cl. 208—11 R **7 Claims**

1. A process for retorting a particulate hydrocarbonaceous solid which comprises:

(a) feeding the hydrocarbonaceous solid and a hot heat-transfer solid into the upper portion of a chute having an angle from the horizontal which exceeds the angle of slide of the mixture of solids and having at least one weir in the path of flow for the solids to control the depth of solids in the chute;

(b) passing on the upstream side of the weir an inert spouting gas across the path of flow for the mixture of solids in the chute at a rate sufficient to form locally a fluidized mixture of heat-transfer solids and hydrocarbonaceous solids;

(c) introducing the mixture of heat-transfer solids and particulate hydrocarbonaceous solids into a moving vertical packed bed and retorting said mixture for a time sufficient to pyrolyze a substantial amount of the hydrocarbons to release product vapors; and



(d) separately recovering product vapors and pyrolyzed solids from the packed bed.

4,432,862

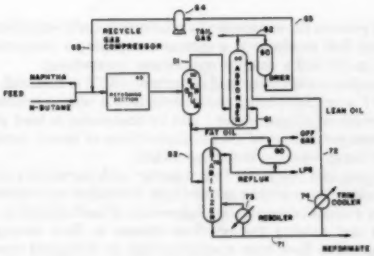
REFORMING AND ISOMERIZATION PROCESS

Gerrit S. Swart, Westfield; Louis S. Dauber, Cranford, and Richard P. O'Connor, Basking Ridge, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 340,071

Int. Cl.³ C10G *35/04*

U.S. Cl. 208—64 **4 Claims**



1. In a process for reforming, with hydrogen, a naphtha feed in a reforming unit which contains a plurality of on stream reactors connected in series, the hydrogen and naphtha flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, a reformate is taken from the final reactor of the series passed into a separator and separated into gaseous and liquid components, at least a portion of the gas is recycled to the reforming unit and the liquid is passed into a stabilizer for recovery of light petroleum gases and a C_5^+ liquid product,

the improvement comprising

including within the reforming unit an absorber,

passing the gaseous component, which contains n-butane and isobutane in admixture, from the separator into the absorber and countercurrently contacting said gas with a portion of the stabilized liquid from the stabilizer as lean oil,

removing the stabilized liquid from the absorber as an isobutane and heavier enriched fat oil and passing same to the stabilizer,

recycling the butanes denuded gas from the absorber to the reforming unit,

adding n-butane to the reforming unit for conversion to isobutane, and

recovering from the stabilizer a C_5+ liquid reformate, and a stream of liquidified petroleum gases from which n-butane and isobutane can be readily recovered.

4,432,863

STEAM REFORMING OF CARBO-METALLIC OILS

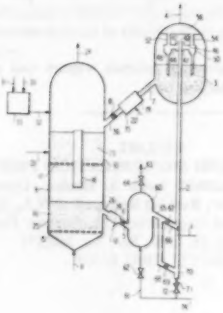
George D. Myers, deceased, late of Ashland, Ky. (by Virginia K. Myers, administratrix); William P. Hettinger, Jr., Russell, Ky.; Stephen M. Kovach, and Oliver J. Zandona, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

PCT No. PCT/US81/00662, § 371 Date Jul. 20, 1981, § 102(e) Date Jul. 20, 1981, PCT Pub. No. WO82/04063, PCT Pub. Date Nov. 25, 1982

PCT Filed May 13, 1981, Ser. No. 288,952

Int. Cl.³ C10G 9/16

U.S. Cl. 208—113 23 Claims



1. A process for economically converting carbo-metallic oils to liquid fuel products in a system comprising a progressive-flow reactor and a catalyst regenerator comprising:

a. providing a converter feed containing 650°F+ material, said 650°F+ material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s), said heavy metal(s) including nickel;

b. bringing said converter feed together with particulate cracking catalyst possessing greater than 600 nickel equivalents to form a stream comprising a suspension of said catalyst in said feed and causing the resultant stream to flow through a progressive flow type reactor having an elongated conversion zone for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900 to about 1400°F and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while depositing at least a portion of said heavy metal(s) on the catalyst and producing coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

c. introducing water into said reactor conversion zone so as to form a mixture of water with said suspension of catalyst and feed, the amount of water introduced into said reactor conversion zone and the amount of reduced nickel on said recycled catalyst being sufficient to provide a steam reforming reaction in said reactor conversion zone so that hydrogen deficient components of said converter feed are converted to products having higher hydrogen to carbon ratios and the amount of said converter feed converted to coke is reduced;

d. separating spent, coke-laden catalyst from the stream of hydrocarbons formed by vaporized feed and resultant cracking products;

e. maintaining, in one or more regeneration zones, one or more fluidized catalyst regeneration beds comprising spent catalyst undergoing regeneration by combustion of the coke with a combustion-supporting gas comprising oxygen on the spent catalyst, and supplying additional spent catalyst to one or more of such fluidized regeneration bed or beds;

f. retaining said catalyst particles in said regeneration zone or zones in contact with a flow of said combustion-supporting gas under conditions of temperature, atmosphere and average total residence time in said zone or zones sufficient for combustion of the coke on the catalyst and for reducing the level of carbon on the catalyst to about 0.25% by weight or less, while forming gaseous combustion product gases comprising CO and/or CO_2, said regenerated catalyst being characterized by a deposited nickel content in at least a partially oxidized state;

g. recycling the regenerated catalyst with said deposits of nickel to the reactor conversion zone for contact with fresh feed.

4,432,864

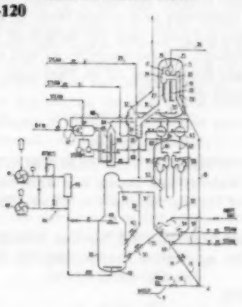
CARBO-METALLIC OIL CONVERSION WITH LIQUID WATER CONTAINING H_2S

George D. Myers, and Lloyd E. Busch, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 94,217, Nov. 14, 1979, Pat. No. 4,347,122. This application Dec. 18, 1981, Ser. No. 332,279

Int. Cl.³ C10G 11/14

U.S. Cl. 208—120 87 Claims



1. A process for economically converting carbo-metallic oils to lighter products, comprising:

I. providing a converter feed containing 650° F.+ material, said 650° F.+ material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 5 parts per million of nickel and vanadium combined;

II. bringing said converter feed together with cracking catalyst having an equilibrium microactivity test conversion activity level of at least about 40 and bearing an accumulation of at least about 1,000 ppm combined of nickel and vanadium expressed as weight of metal(s) on regenerated equilibrium catalyst;

III. bringing said converter feed together with liquid water in a weight ratio relative to feed in the range of about 0.04 to about 0.15, said liquid water containing at least 100 ppm hydrogen sulfide, less than 100 ppm sodium and less than 500 ppm each of calcium and magnesium;

IV. forming a stream containing a mixture of said coverter feed, said catalyst and steam resulting from the vaporization of said liquid water and causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a vapor residence time in the range of about 0.5 to about 10 seconds at a reaction chamber outlet temperature of about 900° to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch

absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts greater than about 6% by weight based on fresh feed, and laying down coke on the catalyst in amounts greater than about 0.3 percent by weight based on catalyst;

V. separating said catalyst from the resultant cracking products;

VI. stripping said separated catalyst;

VII. regenerating said catalyst; and,

VIII. recycling the regenerated catalyst to the reactor for contact with fresh feed.

4,432,865

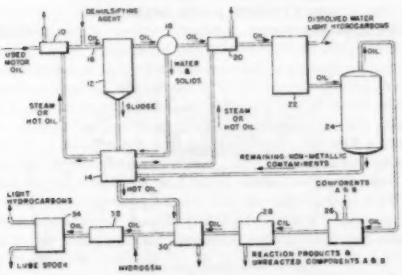
PROCESS FOR TREATING USED MOTOR OIL AND SYNTHETIC CRUDE OIL

George R. Norman, 480-2 Concord Downs Cir., Aurora, Ohio 44202

Continuation-in-part of Ser. No. 342,350, Jan. 25, 1982, abandoned. This application Dec. 8, 1982, Ser. No. 446,791

Int. Cl.³ C10M *11/00*

U.S. Cl. 208—183 **45 Claims**



1. A process for treating used motor oil or synthetic crude oil comprising:

(i) separating substantially all water from said used motor oil or said synthetic crude oil to provide a substantially anhydrous used motor oil or synthetic crude oil;

(ii) contacting said substantially anhydrous used motor oil or synthetic crude oil with an effective amount of (A) a polyfunctional mineral acid and/or the anhydride of said acid and (B) a polyhydroxy compound to react undesired contaminants contained in said used motor oil or synthetic crude oil with components (A) and/or (B) to form one or more reaction products; and

(iii) separating said reaction products from said used motor oil or synthetic crude oil.

4,432,866

MEMBRANE SEPARATION PROCESS

Theodore H. West, Sarnia, and John A. Thompson, Wyoming, both of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 21, 1981, Ser. No. 313,465

Int. Cl.³ C10G *21/28*

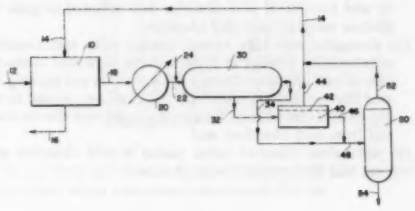
U.S. Cl. 208—321 **12 Claims**

1. A method for separating a lube oil contaminant from a lube oil feedstock containing the contaminant, said method comprising:

(a) passing the lube oil feedstock and a solvent selectively miscible with the contaminant into a solvent extraction zone wherein at least a portion of the lube oil contaminant is separated from the feedstock by the solvent;

(b) passing the solvent containing the lube oil contaminant from the extraction zone into a liquid-liquid decantation zone wherein the solvent containing lube oil contaminant is separated into a first liquid fraction relatively rich in the lube oil contaminant and a second liquid fraction relatively deficient in the lube oil contaminant;

(c) passing first liquid fraction from the decantation zone to a membrane separation zone, wherein the first liquid fraction is still further separated into a retentate relatively rich in the lube oil contaminant, and a permeate relatively deficient in the lube oil contaminant;



(d) recirculating permeate to the solvent extraction zone without further purification; and

(e) passing retentate from the membrane separation zone to a distillation zone wherein the retentate is separated into a distillate fraction and a bottoms fraction, distillate being recycled to the solvent extraction zone.

4,432,867

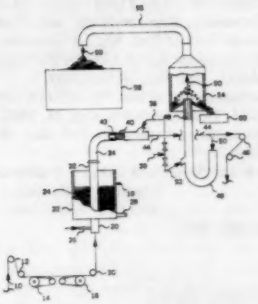
METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIALS FROM FIBROUS MATERIALS

Sanford N. Smith, Spartanburg, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 13, 1980, Ser. No. 206,514

Int. Cl.³ B07B *7/01*

U.S. Cl. 209—140 **5 Claims**



1. In an apparatus for texturing an elongated body of fibrous material by passage thereof through a body of dense, particulate material and removing entrained, dense, particulate material from said elongated body of fibrous material, including means for transporting said fibrous material by a concurrently moving fluid stream, the improvement comprising:

(a) a vertically-disposed chamber means having a frustum-shaped bottom converging upwardly from the lower end of said chamber to a point within the interior of said chamber, thus forming an annular space, between the interior surface of said bottom and the interior surface of said chamber, which diverges outwardly and downwardly from the apex of said bottom to the lower end of said chamber, and an opening through said apex of said bottom, thus forming a fibrous material inlet to said chamber, and having a frustum-shaped top converging up-

wardly from the upper end of said chamber and an opening through the apex of said top, thus forming a fibrous material outlet from said chamber;

(b) said chamber having an unobstructed path from said fibrous material inlet to said fibrous material outlet;

(c) elongated entry tube means coaxial with said chamber, substantially smaller in cross section than the cross-section of said chamber, having an upper open end passing through said fibrous material inlet of said chamber, joined to said bottom of said chamber and adapted to pass said fibrous material into said chamber;

(d) elongated exit tube means coaxial with said chamber, substantially smaller in cross section than said cross-section of said chamber, having a lower open end passing into said fibrous material outlet of said chamber, joined to said top of said chamber and adapted to pass said fibrous material from said chamber; and

(e) particulate material outlet means in said chamber adjacent said lower end of said chamber.

4,432,868

SEPARATION OF HIGH GRADE MAGNETITE FROM FLY ASH

Robert G. Aldrich, Manlius, N.Y., assignor to Halomet, Incorporated, Manlius, N.Y.

Division of Ser. No. 146,697, May 5, 1980, Pat. No. 4,319,988. This application Oct. 5, 1981, Ser. No. 308,379

Int. Cl.³ B02C *23/14*

U.S. Cl. 209—172.5 **2 Claims**

1. Magnetite derived from fly ash obtained as a product of coal combustion which comprises an admixture of spherical particles and broken spherical particles, the broken spherical particles being obtained by grinding spherical particles having a size greater than 325 mesh; said magnetite having a percent magnetics of at least about 96% as measured by Davis Tube and a specific gravity of from about 4.1 to about 4.5 and consisting essentially of particles less than 325 mesh.

4,432,869

METHOD OF TREATING AGRICULTURAL WASTES

Joost Groeneweg, Kreuzae-Drove, and Manfred Schlüter, Grevenbroich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

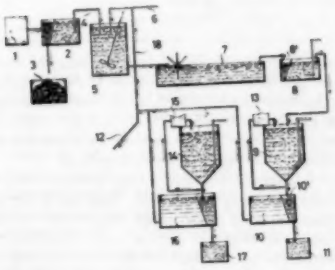
Continuation-in-part of Ser. No. 239,118, Feb. 27, 1981, Pat. No. 4,348,285. This application Aug. 31, 1982, Ser. No. 413,485

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008127

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C02F *3/32*

U.S. Cl. 210—602 **4 Claims**



1. A method of treating liquid agricultural waste water which includes the following sequential steps of:

anaerobically pretreating said waste water;

subjecting said waste water to an algae/bacteria mixture culture in a shallow open air pond for an effective period of time and temperature to obtain an algae/bacteria suspension, while controlling and maintaining the pH of said waste water to prevent any multiplication of rotifers;

subsequently moving said algae/bacteria suspension to an aerated rotifer breeding container for removal of the algae/bacteria, and subjecting said algae/bacteria suspension to a rotifer culture for an effective period of time and temperature, while controlling and maintaining the pH of said algae/bacteria suspension to allow for rotifer multiplication; and

separating said rotifers from the thusly treated suspension to obtain a purified water.

4,432,870

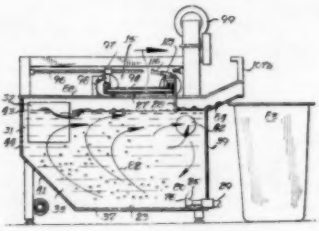
SLUDGE REMOVAL APPARATUS

Frederick E. Russell, Elgin, Ill., assignor to Protectaire Systems Company, Elgin, Ill.

Filed May 6, 1981, Ser. No. 260,888

Int. Cl.³ B05C *15/00*; B01D *21/00*

U.S. Cl. 210—143 **6 Claims**



1. A sludge removing apparatus for removing sludge from a liquid from an adjacent tank having a water return opening, said apparatus comprising:

a tank means for receiving and holding a supply of liquid and sludge,

said tank means having a water inlet at one end thereof at water level to allow surface water and floating sludge thereon to float into the tank means at the water surface level, said adjacent tank having a water level at the water level in said tank means to float the sludge at the same water level into the tank means,

said tank means having upstanding side walls with one of said sidewalls being an end wall over which sludge is removed,

a water return opening below the surface level of the water in the tank means so that floating sludge does not float out of the tank means aligned with and connected to the opening in the adjacent tank to allow water to flow freely between tanks to maintain the same water level in said tank means and adjacent tank,

an automatic skimmer means on said tank means for skimming and extending across a pair of the side walls and for moving the sludge across the surface of the tank means and for skimming and discharging the sludge over the end wall of the tank means, and

liquid circulating means including jets for discharging and circulating liquid across the bottom of said tank means to remove settling particles from the bottom of the tank and for circulating the same upwardly to the water surface level in the tank means for removal by said skimmer means.

4,432,871
IMMUNE ADSORBENT, ADSORBING DEVICE AND BLOOD PURIFYING APPARATUS

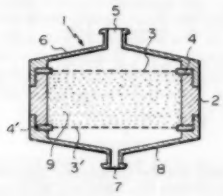
Maokuni Yamawaki; Shozo Suzuki, and Tadaaki Furuta, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 15, 1982, Ser. No. 339,368

Claims priority, application Japan, Jan. 22, 1981, 56-7152; Jul. 21, 1981, 56-112919

Int. Cl.³ B01J *20/22*

U.S. Cl. 210—195.1 **16 Claims**



13. A blood purifying apparatus for adsorbing and removing an autoantibody and/or immune complexes from blood plasma, which comprises a blood introduction zone, a purified blood discharge zone, a blood circulation passage including a plasma separating device and a blood-plasma mixing device, and a plasma recycle passage connected to said blood circulation passage to introduce plasma, separated in the plasma separating device, into said mixing device, through a plasma purifying device, said circulation passage and recycle passage being disposed between said blood introduction zone and said purified blood discharge zone, wherein said plasma purifying device comprises a vessel having fluid inlet and outlet openings and an adsorbing material contained in said vessel, said adsorbing material comprising (a) an insoluble carrier and (b) an organic low-molecular-weight compound containing a hydrophobic compound having a solubility of not more than 100 millimoles in one dl of a physiological saline solution at 25° C., said low-molecular-weight compound being fixed to the insoluble carrier and having a molecular weight not higher than about 10,000.

4,432,872
APPARATUS FOR OXIDATION OR REDUCTION PROCESS IN WATER SOLUTION WITH ELECTROCHEMICALLY ACTIVE CATALYST ON A POROUS CARRIER

Wolfgang Faul, Jülich, and Bertel Kastening, Hamburg, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,622

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023703

Int. Cl.³ B01J *8/06*

U.S. Cl. 210—205 **4 Claims**

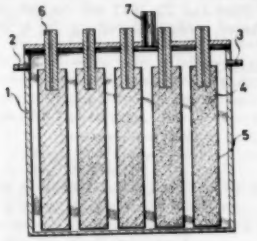
1. A catalysis apparatus for maintaining a catalytic reaction of a gaseous oxidizing or reducing agent with a substance dissolved in water by means of a catalyst and catalyst carrier immersed in said water, comprising:

a supporting core of porous material selected from the group consisting of ceramic materials and structurally firm materials composed principally of carbon particles;

a surface layer of porous activated carbon holding therein a finely divided metallic catalyst material, which layer is more finely porous than said supporting core and sufficiently coherent to remain in place while exposed to surrounding water while said gaseous reagent passes outward therethrough;

means for holding said core, with said layer thereon, substantially immersed in an aqueous solution, and

means for causing a gaseous oxidizing or reducing agent to enter said core without first passing through said layer and



to exit from said core through said layer into said aqueous solution when said core is immersed therein.

4,432,873
HIGH GRADIENT MAGNETIC SEPARATION DEVICE

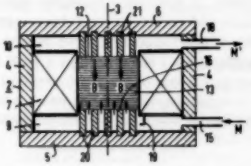
Karl Schuster, Marloffstein/Adlitz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,323

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039171

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—223 **11 Claims**

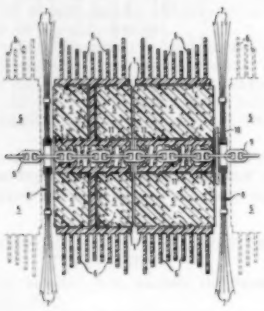


1. In a device for the separation of magnetizable particles down to particle sizes below 1 μm, using the principle of high gradiant magnetic separation technology, from a flowing medium, including a filter structure arranged in a filter space which is disposed between two parts of a ferromagnetic yoke of a magnetic device forming two magnetic poles, in a magnetic field which is oriented substantially parallel or antiparallel to the flow direction of the medium in the region of the filter structure, and which filter structure contains several wire screens arranged closely one behind the other as seen in the flow direction, the screens arranged at least approximately perpendicular to the flow direction of the medium and made of noncorroding ferromagnetic material with a predetermined mesh size and wire thickness, an inlet for introducing said flowing medium into said filter structure, and an outlet for removing said flowing medium from said filter structure the improvement comprising magnetic field carrying elements of ferromagnetic material connected to a corresponding yoke part and extending up to the filter structure, at least on the inlet side of filter structure, said elements distributed at least approximately uniformly over the entrance surface of the filter structure, the total cross sectional area of said elements occupying approximately between $\frac{1}{4}$ and $\frac{1}{3}$ of the cross section of the entrance area so as to avoid turbulence in said flowing medium at the entrance point to said filter structure.

4,432,874
COLLECTING ROPE

Lars Lundin, Kauppiaankatu 4, SF-06150 Porvoo 15, Finland

Filed Jun. 22, 1982, Ser. No. 390,934
Claims priority, application Finland, Jul. 6, 1981, 812122
Int. Cl.³ B01D 17/00
U.S. Cl. 210—242.4 13 Claims



13. A collecting rope for collecting oil or similar material from the surface of water, the rope comprising:

a plurality of flotation units, each of which includes a cylindrical shell to which bristles are attached for collecting oil or similar material from the water's surface and a float layer secured to said cylindrical shell for floating said shell on the water's surface;

a supporting drive member connecting said flotation units for rotation thereof by rotation of said supporting and drive member; and

means providing a resiliently rotatable joint between said flotation units and said supporting drive member for permitting rotation of said supporting drive member relative to said flotation units.

4,432,875
SEMI-PERMEABLE MEMBRANES AND PROCESSES FOR MAKING THE SAME

Wolfgang J. Wrasidlo, and Karol J. Mysels, both of La Jolla, Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 29, 1981, Ser. No. 268,403
Int. Cl.³ B01D 31/00
U.S. Cl. 210—500.2 11 Claims

1. A process for the production of a semi-permeable, porous membrane which comprises a layer of a hydrophobic polymer system, said process comprising the steps of:

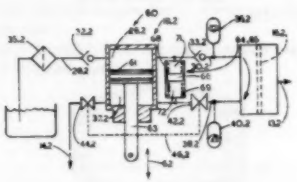
contacting said hydrophobic polymer system with a solution of a polymeric surfactant having both hydrophobic and hydrophilic groups located along its polymer chain and then baking the polymer system with the surfactant in contact with the surface of the polymer system at a temperature of from about 120° C. to about 180° C. for a period sufficient to adhere said surfactant to the surface of said layer to such an extent that it is substantially incapable of being removed from said polymer system during the use of said membrane as a result of said membrane being contacted with water and having a molecular weight of from about 1500 to about 3500.

11. The product produced by the process of claim 1.

4,432,876
REVERSE OSMOSIS APPARATUS AND METHOD INCORPORATING EXTERNAL FLUID EXCHANGE

Bowie G. Keefer, Vancouver, Canada, assignor to Seagold Industries Corporation, Burnabay, Canada

Filed Jul. 30, 1980, Ser. No. 173,456
Int. Cl.³ B01D 31/00, 13/00
U.S. Cl. 210—652 15 Claims



1. Pumping apparatus for membrane separation apparatus for separating a feed fluid into permeate fluid and concentrate fluid fractions which respectively are permeated and rejected by selective membrane means, the pumping apparatus including: a reciprocating feed pump having at least one feed cylinder with a feed displacer mounted on a feed displacer rod reciprocable within the feed cylinder, the cylinder and displacer rod having relative diameters which define cylinder interior/displacer rod proportions to determine in part the recovery ratio of permeate fluid fraction to total feed fluid flow; a pumping chamber on one side of the displacer communicating with inlet conduit means to admit feed fluid, and with outfeed conduit means to conduct feed fluid to the membranes; return conduit means to conduct concentrate fluid from the membranes to an expansion chamber on an opposite side of the displacer; means to reduce fluctuations in pressure and fluid flow across the membranes, first and second valve means communicating with the expansion chamber and pumping chamber respectively and cooperating with the conduit means to direct fluid flow to and from the membrane means and to exhaust de-pressurized concentrate fluid fraction from the expansion chamber, the first valve means having a closed intermediate position between two open positions; reciprocable drive means activating the feed displacer rod and first valve means whilst maintaining a phase difference or angle between the feed displacer stroke and actuation of the first valve means, the pumping apparatus including dwell means having fluid volume exchange means further characterized by:

(a) an exchange conduit means extending externally of the feed cylinder interior and interconnecting the pumping and expansion chambers,

(b) volume exchange control means within the exchange conduit to control volume exchange between the chambers,

so that fluid volume is exchanged between the chambers to approximately equalize pressure between the pumping and expansion chambers following reversal of feed displacer rod movement and to provide a dwell interval or angle sufficient to shift the first valve means across an effectively closed intermediate position thereof while initial movement of the feed displacer rod tends to equalize pressure differences across ports of the first valve means that are about to be opened prior to opening of such ports.

4,432,877
ORGANO-MERCURIAL MATERIALS

Nathan R. Tzodikov, Marshfield, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Oct. 19, 1981, Ser. No. 312,716
Int. Cl.³ B01D 15/08
U.S. Cl. 210—656 14 Claims

9. A method of separating a sulfhydryl compound containing at least one sulfhydryl group from other compounds, com-

prising contacting a mixture of the sulfhydryl compound and the other compounds with an affinity product in a chromatographic column, said affinity product comprising a metal having an affinity for sulfhydryl groups, said metal being coupled covalently to an inorganic carrier having available hydroxide or oxide groups, said metal being coupled to the inorganic carrier by means of a silane coupling agent having the formula:

$$(YR^1)_nSi(R^2)_{4-n}$$

where Y is a functional group which will react with a mercuric compound, selected from hydroxyl, amino, carboxyllic acid, acyl, acyloxy, isocyano, isothiocyano, sulfhydryl or a diazonium salt: R^1 is alkyl, lower alkenyl, lower alkyl-aryl, or aryl; R^2 is selected from the group of lower alkoxy, phenoxy and halo; and n is an integer from 1 to 3, and separating such mixture from an affinity product.

4,432,878
COOLING ARRANGEMENT AND METHOD OF OPERATING THE SAME

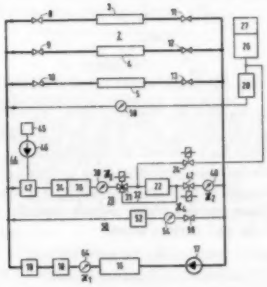
Horst W. Emshoff, Mülheim an der Ruhr, and Walter Küsebauch, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1981, Ser. No. 279,052

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027362

Int. Cl.³ B01J *47/14*

U.S. Cl. 210—662 **6 Claims**



4. A method for operating a cooling arrangement, said cooling arrangement comprising a closed cooling system containing a main loop and a parallel loop, said parallel loop having an alkalizing cation exchanger, an anion exchanger in the hydroxide form and a mixed-bed filter in series, and means for bypassing said filter, comprising conducting water in said parallel loop through the alkalizing cation exchanger, the anion exchanger and through said bypass, closing said bypass and connecting said mixed-bed filter into the parallel loop when the pH-value of the cooling water reaches a predetermined upper limit, and thereafter disconnecting said mixed-bed filter and opening said bypass when the pH-value of the cooling water drops from said upper limit.

4,432,879
TREATMENT OF AQUEOUS SYSTEMS

Brian Greaves, and Paul Ingham, both of Runcorn, England, assignors to Dearborn Chemicals, Ltd., Widnes, England

Continuation of Ser. No. 194,033, Oct. 6, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,525

Claims priority, application United Kingdom, Oct. 23, 1979, 7936773

Int. Cl.³ C02F *5/14*

U.S. Cl. 210—699 **6 Claims**

1. Method of suspending sediment in cooling water systems that comprises adding thereto 2-phosphonobutane-1,2,4-tricarboxylic acid and a copolymer of methacrylic acid and 2-acrylamido-2-methylpropane sulfonic acid in a molar ratio of about 1:1 or a copolymer of styrene sulfonic acid and maleic acid in a molar ratio of about 3:1, said copolymer having a molecular weight of from about 4,000 to 6,000 and said 2-phosphonobutane-1,2,4-tricarboxylic acid and copolymer being added in a respective weight ratio of about 4:1 to 1:4 and in a total dosage of about 0.1 to 50 ppm.

4,432,880
PROCESS FOR THE REMOVAL OF HEAVY METALS FROM AQUEOUS SOLUTION

Richard S. Talbot, Media, Pa., assignor to Richard S. Talbot and Associates, Media, Pa.

Filed Dec. 10, 1981, Ser. No. 329,388

Int. Cl.³ C02F *1/62*

U.S. Cl. 210—725 **21 Claims**

1. In a process for the removal of one or more heavy metals from an aqueous system containing at least two heavy metals by the addition of a soluble sulfide to precipitate at least one of said heavy metals as the sulfide thereof, the improvement which comprises:

adding an amount of soluble sulfide statistically determined to be sufficient to precipitate as the sulfide substantially all of at least one heavy metal to the limits of its metal sulfide solubility;

said statistically determined amount of soluble sulfide being less than the amount required to pecipitate as the metal sulfide at least one other heavy metal in said system having a soluble sulfide equilibrium concentration sufficiently higher than that of said selected heavy metal to thus permit selective precipitation of said selected metal and of any other heavy metals present having lower sulfide equilibrium solubility concentrations than that of the selected heavy metal, with said precipitation being to the limits of the metal sulfide solubilities;

and

precipitating at least a portion of at least one heavy metal remaining in said system after said sulfide precipitation by a means other than by sulfide precipitation;

whereby an aqueous effluent is obtained which contains no sulfide.

4,432,881
WATER-DISPERSIBLE HYDROPHOBIC THICKENING AGENT

Syamalarao Evani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 6, 1981, Ser. No. 232,327

Int. Cl.³ C09K *7/02*; E21B *43/22, 43/26*

U.S. Cl. 252—8.5 A **36 Claims**

1. A water soluble composition for thickening aqueous liquids comprising

(A) a water-soluble thickening agent which agent comprises

(1) a water-soluble polymer having pendant hydrophobic groups, said polymer being a copolymer of a water-soluble ethylenically unsaturated monomer and water-insoluble ethylenically unsaturated monomer having a hydrophobic group having at least 8 carbon atoms, wherein

(a) the water-soluble monomer is an ethylenically unsaturated amide or an N-substituted derivative thereof, an ethylenically unsaturated carboxylic acid, an ethylenically unsaturated quaternary ammonium compound, a sulfoalkyl ester of an unsaturated carboxylic acid, an aminoalkyl ester of an unsaturated carboxylic acid, a diallylamine, a diallylammonium compound or a vinylaryl sulfonate,

and

(b) the water-insoluble monomer is a higher alkyl ester of an α,β-ethylenically unsaturated carboxylic acid,

an alkylaryl ester of an ethylenically unsaturated carboxylic acid, an N-alkyl ethylenically unsaturated amide, vinyl alkyl ether or an ar-alkyl styrene; and

(2) a water-dispersible nonionic surfactant having hydrophobic groups that are capable of associating with the hydrophobic groups of the copolymer such that at ambient conditions, water containing 0.5 weight percent of the thickening agent has a viscosity at least twice the viscosity of water, said thickening agent having a weight ratio of the copolymer to the surfactant in the range from about 20:1 to about 0.5:1, and

(B) a water-soluble inorganic salt in an amount such that at a temperature in the range up to about 80° C., an aqueous medium containing a viscosity increasing amount of the thickening agent exhibits a further increase in viscosity when the water-soluble salt is added to the medium.

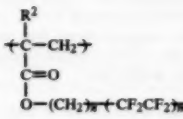
4,432,882

HYDROCARBON FOAMS

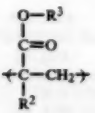
Stuart Raynolds, Wilmington, Del., and Louis B. Fournier, Media, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1981, Ser. No. 331,892
Int. Cl.³ E21B *43/26, 43/27*
U.S. Cl. 252—8.55 R **3 Claims**

3. A method of extending an initially fractured subterranean formation penetrated by a well bore with a foam, said foam comprising a hydrocarbon, a propping agent and from 0.05 to 5 weight percent as based on the hydrocarbon of a copolymer containing from 25 to 60 weight percent units of the structure



where $-R^1$ is $-H$ or $-F$, $-R^2$ is $-H$ or $-CH_3$, m is an integer from 2 to 10 and n is 1 or 2; and from 75 to 40 weight percent units of the structure;



where $-R^3$ is an alkyl group containing from 10 to 20 carbon atoms and $-R^2$ has the above defined meaning.

4,432,883

SEAL WITH TEFLON OR RUBBER

Allen F. Denzine, Chardon, Ohio, and William E. F. Thurber, Jr., Houston, Tex., assignors to Resistic Materials Inc., Houston, Tex.

Filed Dec. 9, 1981, Ser. No. 329,009
Int. Cl.³ C10M *7/28, 7/52*
U.S. Cl. 252—12 **18 Claims**

1. A composition of matter comprising about 50% to about 90% by weight of a polymeric material selected from the group consisting of polytetrafluoroethylene, polyurethane, nitrile, fluoroelastomer, and polyphenylene sulfide, and about 10% to about 50% by weight of another material comprising about 15% to 60% by volume of grains of titanium carbide dispersed through a metal matrix, wherein said metal matrix comprises a nickel-chromium matrix consisting essentially by weight of about 50% to 80% nickel, about 10% to 25% chromium, up to about 16% molybdenum or tungsten, up to about 1% carbon, and the balance essentially iron.

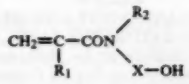
4,432,884

SCALE INHIBITING AGENT

Yoshinari Kawasaki, Osaka, and Kenji Hanno, Hirakata, both of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

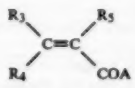
Filed Jul. 19, 1982, Ser. No. 399,816
Int. Cl.³ C02F *5/12*
U.S. Cl. 252—180 **8 Claims**

1. A scale inhibiting agent comprising as an active ingredient a copolymer of at least one of an alkylolamide compound having the general formula (I);



(I)

wherein R_1 and R_2 independently represent a hydrogen atom or an alkyl group having one to three carbon atoms, and X is a bond or a straight or branched-chain alkylene group having one to eight carbon atoms, and at least one of an alkenyl compound having the general formula (II);



(II)

wherein R_3, R_4 and R_5 independently represent a hydrogen atom or methyl group, and A is hydroxy group or $-OR_6$ group in which R_6 is a lower alkyl group of one to four carbon atoms which may be substituted by a hydroxy group; an amino group or an $-NHR_7$ group in which R_7 is a lower alkyl group of one to four carbon atoms which may be substituted by $-SO_3H$ at the end carbon atom.

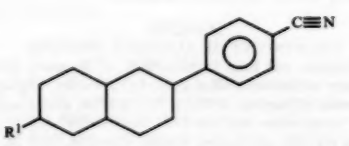
4,432,885

DECALINS

Martin Petrzilka, Kaiseraugst, and Kuno Schleich, Zollikerberg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 9, 1981, Ser. No. 328,979
Claims priority, application Switzerland, Dec. 23, 1980, 9524/80; Aug. 26, 1981, 5513/81
Int. Cl.³ C07C *43/116, 49/30, 63/00, 69/76, 103/22, 121/64, 13/50, 25/02, 13/47;* C09C *3/34;* C09K *3/34*
U.S. Cl. 252—299.61 **18 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, methyl, $-CH_2R$, $-OR$ or $-CH_2OR$, R is alkyl; and R^1 has up to 12 carbon atoms, its racemates or its optically active antipodes.

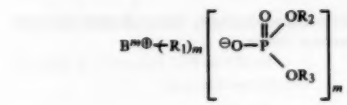
4,432,886

CATIONIC FLUORESCENT WHITENING AGENTS

Hans R. Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 200,738, Oct. 27, 1980, Pat. No. 4,384,121.
This application Sep. 22, 1982, Ser. No. 421,201
Claims priority, application Switzerland, Nov. 1, 1979, 9808/79
Int. Cl.³ C07D *405/04, 413/02*
U.S. Cl. 252—301.27 7 Claims

1. A fluorescent whitening composition which is an aqueous solution of 1 to 60% by weight, based on the weight of the solution, of a cationic fluorescent whitening agent of the formula



wherein

B is a fluorescent whitening agent selected from the group consisting of 2-furanylbenzimidazoles, 2-azolylbenzimidazoles, 2-stilbenylbenzimidazoles and 2,5-(benzimidazolyl)furanes,

m is the number of basic amino groups, and each of R_1, R_2 and R_3 is alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted by a non-chromophoric group, or is alkenyl of 2 to 4 carbon atoms which is unsubstituted or substituted by a non-chromophoric group.

4,432,887

DE-EMULSIFICATION AGENTS OF MICROBIOLOGICAL ORIGIN

James E. Zajic, College of Science, University of Texas, El Paso, Tex. 79968, and David G. Cooper, 96 Kent St., London, Ontario, Canada (N6A 1L1)

Filed Sep. 2, 1981, Ser. No. 298,734
Claims priority, application Canada, Sep. 8, 1980, 359801
Int. Cl.³ B01D *17/04;* C02C *5/02;* C02F *3/34*
U.S. Cl. 252—331 14 Claims

1. A process of destabilizing an oil-in-water or water-in-oil emulsion, which comprises treating the emulsion with an effective amount of at least a portion of the liquid broth resulting from the culturing and growth therein of a bacterial microorganism on a carbon-containing substrate under growth promoting conditions, said bacterial microorganism being one which produces effective de-emulsifying fermentation products for the type of emulsion chosen and being selected from the group of species consisting of Nocardia amarae, *Nocardia erythropolis, Rhodococcus aurantiacus, Rhodococcus rubropertinctus, Arthrobacter paraffineus, Corynebacterium hydrocarboclastus, Corynebacterium oxydans, Corynebacterium petrophilum, Corynebacterium lepus, Corynebacterium fascians, Corynebacterium hydrocarbooxydans, Mycobacterium cuneatum, Mycobacterium petroleophillum, Mycobacterium parafortuitum, Mycobacterium rhodochrous* and *Mycobacterium brevicale.*

4,432,888

SURFACE ACTIVE AGENTS BASED ON POLYPEPTIDES

Gheorghe Cioca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Filed Sep. 30, 1981, Ser. No. 307,016
Int. Cl.³ B01F *17/30;* C07C *143/34;* C11D *1/88*
U.S. Cl. 252—354 18 Claims

1. A surface active agent comprised of the reaction product of an alkyl phenylsulfonic acid and a polypeptide at an acidic pH at a ratio of 1 to 1.5 parts by weight of said sulfonic acid to 0.9 to 1.65 parts by weight of said polypeptide.

4,432,889

HETEROGENEOUS CATALYST

John L. Garnett, Longueville; Mervyn A. Long, St. Ives, and Ronald G. Levot, Oyster Bay, all of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Feb. 6, 1981, Ser. No. 225,409
Int. Cl.³ B01J *31/24*
U.S. Cl. 502—5 19 Claims

1. A process for the production of a heterogeneous catalyst comprising the steps of:

(a) irradiating an organic macromolecular substrate or a metal substrate with ionising or ultra violet radiation in the presence of a monomer selected from the group consisting of o-, m-, or p-styryl diphenyl phosphine and o-, m- or p-phenyl acrylyl diphenyl phosphine, to graft the monomer to the substrate, and

(b) reacting the graft copolymer with a homogeneous catalyst selected from the group consisting of catalytic metal salts and catalytic organometallic complexes such that the monomer-substrate conjugate becomes a ligand of the catalyst.

4,432,890

IMMOBILIZATION OF VANADIA DEPOSITED ON CATALYTIC MATERIALS DURING CARBO-METALLIC OIL CONVERSION

H. Wayne Beck, Russell; James D. Carruthers, Catlettsburg; Edward B. Cornelius, Ashland; William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland; James L. Palmer, Flatwoods, and Oliver J. Zandona, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

PCT No. PCT/US81/00356, § 371 Date Mar. 30, 1981, § 102(e) Date Mar. 30, 1981, PCT Pub. No. WO82/03225, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 19, 1981, Ser. No. 277,751
Int. Cl.³ B01J *29/08, 29/18*
U.S. Cl. 502—62 15 Claims

1. A composition of matter comprising silica or silica-alumina, kaolin clay, crystalline alumino-silicate zeolite and a titania gel in an amount in the range of about 1 to about 8 wt % and a metal additive in a mount sufficient to immobilize vanadium compounds during the regeneration of said composition at catalyst regeneration temperatures.

3. A composition of matter comprised of a metal additive in an amount sufficient to immobilize vanadium compounds during the regeneration of said composition at catalyst regeneration temperatures, silica or silica-alumina, kaolin clay, crystalline alumino-silicate zeolite, and an alumina gel in an amount in the range of about 1 to about 8 wt %.

5. A composition of claim 1 wherein said metal additive to immobilize vanadium compounds deposited on said composition comprises Mg, Ca, Sr, Ba, Sc, Y, La, Ti, Zr, Hf, Nb, Ta, Mn, Ni, In, Tl, Bi, Te, or an element in the lanthanide or actinide series, or a combination of 2 or more of said elements.

4,432,891

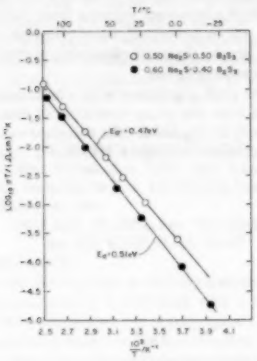
GLASS CAPABLE OF IONIC CONDUCTION AND METHOD OF PREPARATION

Sherman Susman, Park Forest; Charles J. Delbecq, Downers Grove, both of Ill.; Kenneth J. Volin, Fort Collins, Colo., and Leah Boehm, Jerusalem, Israel, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,525

Int. Cl.³ C03C *3/12, 3/30;* **H01B** *1/10*

U.S. Cl. 252—518 **2 Claims**



1. An electrically conductive glass consisting essentially of an amorphous mixture of $(1-X)Na_2S{:}X\ B_2S_3$ wherein X is about 0.5 to 0.7.

4,432,892

PROCESS FOR THE SAFE INTERMEDIATE AND FINAL STORAGE OF TRITIUM

Horst Ebinger, Bad Soden-Salmuenster; Martin Kadner, Maintal, and Guenther Luthardt, Rodenbach, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,346

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018745

Int. Cl.³ G21F *9/02, 9/16*

U.S. Cl. 252—628 **16 Claims**

1. In a process for the safe intermediate and final storage of tritium after reaction of tritium or a tritium containing gas with a hydride forming metal in comminuted form, the improvement comprising pressing to a molded body at room temperature a mirton of the tritium containing metal particles and a metal which has a low permeability for tritium.

4,432,893

PRECIPITATION-ADSORPTION PROCESS FOR THE DECONTAMINATION OF NUCLEAR WASTE SUPERNATES

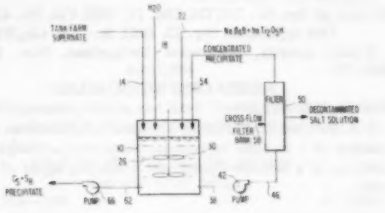
Lien-Mow Lee, North Augusta, and Lester L. Kilpatrick, Aiken, both of S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,800

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—631 **21 Claims**

1. Process for the removal of the residual hazardous soluble values from a nuclear waste solution which comprises simultaneously contacting said solution with sufficient sodium tetraphenylboron and sufficient sodium titanate to form an insoluble slurry including said hazardous values and filtering said



solution to separate and substantially decontaminate said solution of said hazardous values.

4,432,894

PROCESS FOR TREATMENT OF DETERGENT-CONTAINING RADIOACTIVE LIQUID WASTES

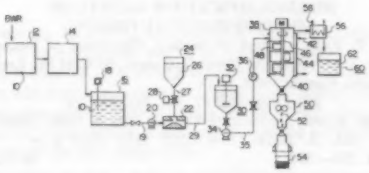
Kunio Kamiya, Hitachi; Kenji Motojima, Mito; Kiyomi Funabashi, Katsuta; Koichi Chino, and Susumu Horiuchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 249,012

Claims priority, application Japan, Apr. 4, 1980, 55-44930

Int. Cl.³ G21F *9/08, 9/12*

U.S. Cl. 252—632 **18 Claims**



1. A process for the treatment of detergent-containing radioactive liquid waste, said waste comprising sodium sulfate and powdery ion exchange resin, said process comprising:

(a) measuring a chemical oxygen demand concentration of a radioactive liquid waste,

(b) adding an adsorbent to the waste in accordance with the measured concentration, and

(c) concentrating and drying the waste by heating, thereby converting the waste into powder.

4,432,895

MONOMERIC INTERFERONS

Stanley J. Tarnowski, Nutley, N.J., assignor to Hoffmann-La Roche, Nutley, N.J.

Filed Nov. 24, 1982, Ser. No. 444,113

Int. Cl.³ A61K *45/02;* **C07G** *7/00*

U.S. Cl. 260—112 R **11 Claims**

1. A method for producing biologically active interferon in which essentially all of the interferon is in monomeric form which comprises treating a sample of purified or partially purified interferon with an effective amount of a redox reagent to convert oligomeric interferon to biologically active monomeric interferon and to prevent the formation of oligomeric interferon from monomeric interferon.

4,432,896

DERIVATIVES OF HIPPURYL-L-PHENYLALANINE

Masami Sugiyama, Hachioji; Yasushi Kasahara, Tama, and Yoshihiro Ashihara, Fuchu, all of Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

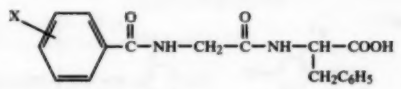
Filed Sep. 24, 1982, Ser. No. 423,494

Claims priority, application Japan, Dec. 16, 1981, 56-201587

Int. Cl.[3] C07C *103/52*

U.S. Cl. 260—112.5 R 4 Claims

1. Derivatives of hippuryl-L-phenylalanine having the following general formula:



wherein X represents OH or CH_3O.

4,432,897

CATIONIC THIADIAZOLYL TRIAZENE DYESTUFFS

Hauke Fürstenwerth, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

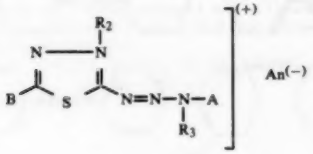
Filed Nov. 16, 1981, Ser. No. 321,823

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045912

Int. Cl.[3] C07C *107/00;* C09B *56/20;* D06P *1/42, 3/18*

U.S. Cl. 260—140 3 Claims

1. A cationic triazene dyestuff of the formula



wherein

B is alkylmercapto, arylmercapto or

R is hydrogen, alkyl, alkenyl, C_1–C_4-alkylcarbonyl, benzoyl, benzoyl substituted by halogen or C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl, mono-C_1–C_4-alkylaminocarbonyl, di-C_1–C_4-alkylaminocarbonyl, benzylaminocarbonyl, C_1–C_4-alkylsulphonyl, phenylsulphonyl, di-C_1–C_4-alkylaminosulphonyl, cycloalkyl, aryl, aralkyl, amino, alkylamino, dialkylamino, arylamino or aralkylamino,

R_1 is hydrogen, alkyl, alkenyl or aralkyl, or

R and R_1 together with the nitrogen atom to which they are bonded are pyrrolidine, piperidine, morpholine, piperazine, N-methyl-piperazine or N-hydroxyethylpiperazine,

R_2 and R_3 each independently is alkyl, alkenyl, alkynyl or aralkyl, or one of them is hydrogen, or

R_3 is bonded to the o-position of A, and together with the nitrogen atom and A is dihydroindole, tetrahydro-1,4-benzoxazine which is unsubstituted or substituted by 1–4 C_1–C_4-alkyl or C_1–C_4-alkoxy,

A is aryl, and

$An^{(-)}$ is an anion,

or a substitution product thereof wherein the cyclic and acyclic radicals are substituted by cyano, hydroxyl, halogen, nitro, alkyl, monoalkylamino, dialkylamino, phenyl, alkoxy, alkoxycarbonyl, alkoxcarbonyloxy, C_1–C_4-alkyl-carbonyloxy or carboxyl; or R–R_3 is substituted by phenoxy, benzyloxy or amidocarbonyl.

4,432,898

SULFO-SUBSTITUTED FIBRE-REACTIVE 1:2-CHROMIUM COMPLEX AZO DYES

Gerhard Back, Lörrach, Fed. Rep. of Germany; Fabio Beffa, Riehen, and Hans-Ulrich Schütz, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

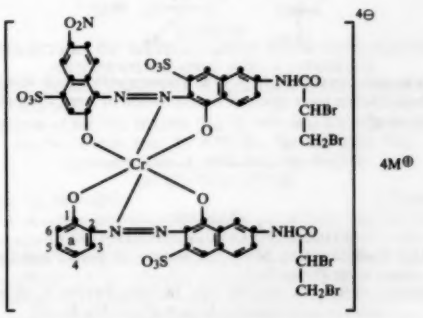
Continuation of Ser. No. 971,140, Dec. 19, 1978, abandoned, which is a continuation of Ser. No. 805,754, Jun. 13, 1977, abandoned. This application Oct. 23, 1980, Ser. No. 199,789

Claims priority, application Switzerland, Jun. 24, 1976, 8086/76; Mar. 14, 1977, 3153/77

Int. Cl.[3] C09B *62/012, 62/675;* D06P *1/38, 3/10*

U.S. Cl. 260—145 A 2 Claims

1. A chromium complex dye of the formula



wherein the ring is substituted by 4- or 5-nitro, and M is a cation.

4,432,899

PREPARING CONCENTRATED AZO DYE SOLUTIONS USING NITRITE SALT AS BOTH COUPLING COMPONENT AND DIAZOTIZING AGENT

Karl Linhart, Leverkusen; Harald Gleinig, Odenthal, and Günther Boehmke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

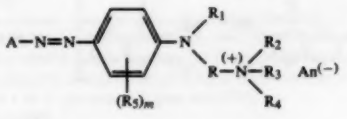
Filed Dec. 30, 1981, Ser. No. 335,940

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101140

Int. Cl.[3] C09B *44/02, 44/04;* D06P *1/41*

U.S. Cl. 260—157 7 Claims

1. Process for the preparation of a concentrated, stable solution, with a low salt content, of a cationic azo dyestuff of the formula



wherein

A denotes the radical of an aromatic carbocyclic or aromatic heterocyclic diazo component,

R denotes alkylene,

R_1 denotes hydrogen or alkyl,

R_2 denotes alkyl, alkenyl or aralkyl,

R_3 denotes alkyl,

R_4 denotes hydroxyalkyl having 2 or more C atoms,

R_5 denotes halogen, alkyl, alkoxy, aryloxy, C_1–C_4-alkylcar-

bonyl, C_1–C_4-alkylsulphonyl, benzoyl, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulphonylamino or benzoylamino,

m denotes 0, 1, 2, 3 or 4, and

An^- denotes a carboxylic ion,

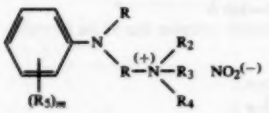
and wherein

the cyclic and acyclic substituents are unsubstituted or substituted by non ionic substituents,

comprising reacting an amine of the formula

$$A-NH_2$$

with a nitrite of the formula



in an aqueous carboxylic acid in a concentration such that the final solution has a dyestuff concentration of from 10 to 60% by weight.

4,432,900

CATIONIC DYESTUFF PRINTING INKS

Alex Pociluyko, Glen Mills, Pa., assignor to Scott Paper Company, Scott Plaza, Pa.

Division of Ser. No. 206,730, Nov. 14, 1980, Pat No. 4,340,386, which is a continuation-in-part of Ser. No. 88,288, Oct. 26, 1979, Pat. No. 4,359,419.

This application Jul. 14, 1981, Ser. No. 283,232

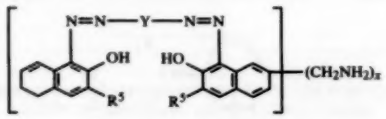
The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

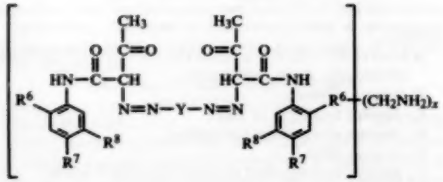
Int. Cl.³ C09B *31/10, 67/00;* **D06P** *3/60, 5/02*

U.S. Cl. 260—160 **3 Claims**

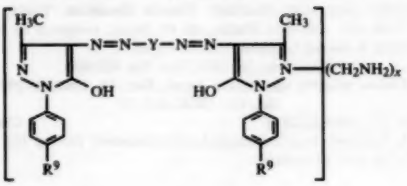
1. The reaction product of an aldehyde selected from the group consisting of formaldehyde, glyoxal and glutaraldehyde and a cationic, water-soluble dyestuff having a functional group capable of reacting with said aldehyde wherein the functional group of the cationic, water-soluble dyestuff is a lower alkylene amine of the formula $—(CH_2)_nNH_2$ wherein n is from 1 to 5.

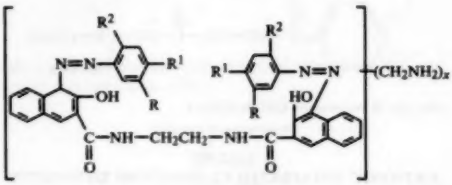
2. The reaction product of claim 1 wherein the water-soluble dyestuff is a mixture consisting essentially of a disazo compound which is polyaminomethylated with an average of x aminomethyl groups per molecule wherein said disazo compound is selected from group consisting of





-continued

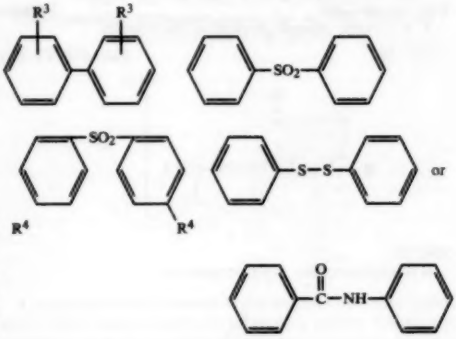




in which

x represents a number in the range of one to eight

Y represents a divalent moiety selected from the class having the formulas



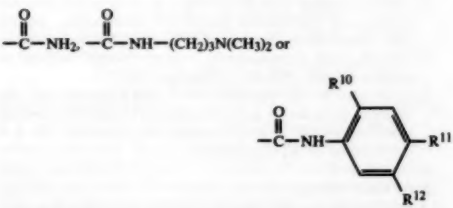
R represents hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy or N-phenylsulfamoyl,

R^1 represents hydrogen, C_1, to C_3 alkyl, C_1 to C_3 alkoxy, halo, N-phenylsulfamoyl or 6-methylbenzothiazol-2-yl,

R^2, R^3, R^7, R^8, R^{10}, R^{11} and R^{12} represent hydrogen, C_1 to C_3 alkoxy or halo,

R^4 represents hydrogen, C_1 to C_3 alkyl or C_1 to C_3 alkoxy,

R^5 represents hydrogen or a monovalent moiety selected from the class having the formulas



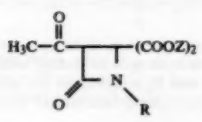
R^9 represents hydrogen or C_1 to C_3 alkyl; and the acid-addition salt forms of said mixtures.

4,432,901
BETA-LACTAM COMPOUNDS CONTAINING A C-ACETAL GROUP AND PROCESS FOR THEIR PREPARATION

Karoly Lempert; Kalman Harsanyi; Gabor Doleschall; Gyula Hornyak; Jozsef Nitrai, all of Budapest; Karoly Zauer, Szentendre; Jozsef Fetter, Budapest; Gyula Simig, Budapest; Zsuzsanna Visky nee Gombos, Budapest, and Gizella Barta nee Szalai, Vecses, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sep. 11, 1981, Ser. No. 301,884
Claims priority, application Hungary, Sep. 15, 1980, 2262/80
Int. Cl.³ C07D *205/08*
U.S. Cl. 260—239 A 4 Claims

1. A compound of the formula (III)



wherein

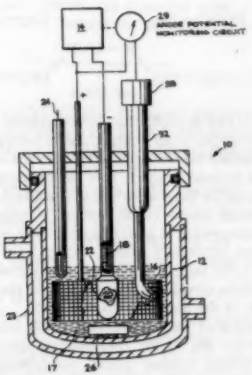
R is benzyl, 4-methoxy-benzyl, or 2,4-dimethoxy-benzyl; and

Z is C_1 to C_4 alkyl.

4,432,902
METHOD FOR SYNTHESIZING HMX

Raymond R. McGuire, Brentwood; Clifford L. Coon, Fremont; Jackson E. Harrar, Castro Valley, and Richard K. Pearson, Pleasanton, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 20, 1982, Ser. No. 399,948
Int. Cl.³ C07D *257/12*
U.S. Cl. 260—239 HM 11 Claims



1. A method of synthesizing cyclotetramethylenetetranitramine (HMX), comprising:

(a) providing an electrochemical cell including a cathode disposed in a cathode compartment and an anode disposed in an anode compartment, said anode and cathode being operatively connected to a power source;

(b) placing a solution of N_2O_4/HNO_3 within said anode compartment, and a solution of HNO_3 in said cathode compartment;

(c) applying and maintaining a controlled potential of about 1.35 to 2.00 V vs. SCE between said N_2O_4/HNO_3 solution and said anode;

(d) forming N_2O_5 as a product step of (c) above through the application of said potential;

(e) adding said N_2O_5 formed in step (d) to a solution selected from 1,5-diacetyl-3,7-dinitro-1,3,5,7-tetraazacyclooctane (DADN) or 1,3,5,7-tetracetyl-1,3,5,7-tetraazacyclooctane (TAT), wherein the molar ratio of N_2O_5 to DADN or TAT is about 3.6;

(f) heating the solution formed in step (e) to a temperature of about 35°–45° C.;

(g) adding the product formed from step (f) to water; and

(h) forming HMX as a product of step (g).

4,432,903
BIS-ESTERS OF METHANEDIOL WITH PENICILLINS AND PENICILLANIC ACID 1,1-DIOXIDE

Eric C. Bigham, Chapel Hill, N.C., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 185,090, Sep. 8, 1980, which is a division of Ser. No. 39,539, May 16, 1979, Pat. No. 4,244,951. This application Dec. 3, 1982, Ser. No. 446,612
Int. Cl.³ C07D *499/32*
U.S. Cl. 260—239.1 3 Claims

1. A compound selected from the group consisting of 6'-(2-benzyloxycarbonylamino-2-phenylacetamido)penicillanoyloxymethyl penicillanate 1,1-dioxide, 6'-(2-[4-nitrobenzyloxycarbonylamino]-2-phenylacetamido)penicillanoyloxymethyl penicillanate 1,1-dioxide and 6'-(2-[4-nitrobenzyloxycarbonylamino]-2-[4-hydroxyphenyl]acetamino)penicillanoyloxymethyl penicillanate 1,1-dioxide.

4,432,904
PHOSPHINE AZACROWN ETHER COMPOUNDS

Stephan J. McLain, and Francis J. Waller, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,357
Int. Cl.³ C07F *9/65*
U.S. Cl. 260—330.6 10 Claims

1. A phosphine azacrown compound having the formula:

$$R_2P(CH_2)_mNCH_2(CH_2OCH_2)_nCH_2M_{0,1}$$

wherein

R is selected from the group consisting essentially of phenyl, naphthyl, substituted phenyl, and substituted naphthyl, the substituents being selected from the group consisting essentially of hydrocarbyl of up to about 6 carbons, alkoxy of 1 to 4 carbons, halogen, and CF_3;

m is 0 to 4;

n is 3 to 6; and

M is a cation selected from the group consisting essentially of Li^+, Na^+, K^+, Rb^+, Tl^+, Cs^+, Fr^+, Ca^{2+}, Zn^{2+}, Cd^{2+}, Hg^{2+}, Sr^{2+}, Ba^{2+}, Ra^{2+}, Pb^{2+}, and lanthanide^{3+}; when a cation is present, the corresponding anion is selected from the group consisting essentially of F^-, Cl^-, Br^-, I^-, At^-, BF_4^-, PF_6^-, BPh_4^-, $CF_3SO_3^-$, SCN^-, NO_3^-, picrate$^-$, SiF_6^{2-}, SO_4^{2-}, and PO_4^{3-}.

4,432,905
SIMPLIFIED PROCESS FOR THE DEGRADATION OF STEROID-C-22-CARBOXYLIC ACIDS

Michael Bahn, Hilden; Wolfgang Preuss, Monheim; Rolf Schmid, Dusseldorf, and Rüdiger Wagner, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 262,966, May 12, 1981, abandoned, Ser. No. 262,970, May 12, 1981, abandoned, and Ser. No. 262,971, May 12, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 391,841

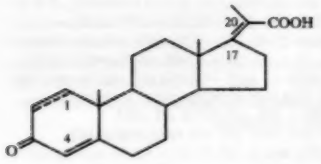
Claims priority, application Austria, May 12, 1980, 2534/80; May 12, 1980, 2629/80; Jun. 9, 1980, 3031/80

Int. Cl.[3] **C07J** *9/00*

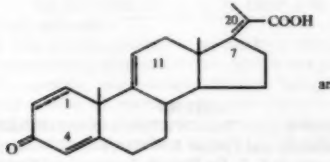
U.S. Cl. 260—397.1 **26 Claims**

1. A process of producing C20-carbonyl steroids from steroid C22-carboxylic acids by side chain degradation consisting essentially of:

(1) reacting Δ^4(5)-BNC-compounds with an additional ene-bond in the 17(20)-position having the formulae:

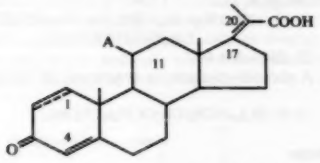


(1)



and

(2)



(3)

wherein A represents an α-hydroxyl, a β-hydroxyl or, together with the carbon atom substituted by A, a carbonyl, with a carboxylic acid halogenating agent under conditions whereby unwanted ring halogenation products are avoided, to form the corresponding 22-carboxylic acid halide,

(2) reacting the $\Delta^{17(20)}$-steroid-22-carboxylic acid halide with a metal azide in an aqueous/organic two-phase reaction in the presence of quaternary ammonium salts as a phase transfer catalyst at a temperature of below about 25° C.,

(3) hydrolyzing the azide formed by heating in the presence of an aqueous acid with elimination of nitrogen, and

(4) recovering the corresponding C20-carbonyl steroid.

4,432,906
INHIBITORS OF SRS-SYNTHESIS

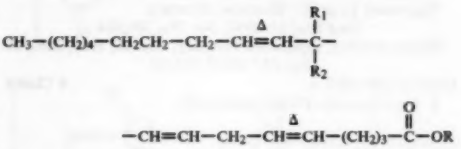
Noal Cohen, Montclair, and Giuseppe Weber, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1981, Ser. No. 301,613

Int. Cl.[3] **C11C** *3/02;* **A61K** *31/23*

U.S. Cl. 260—410.9 R **3 Claims**

1. A compound of the formula:



wherein Δ designates a cis configuration, R is hydrogen or lower alkyl; and R_1 and R_2 are hydrogen or methyl with the proviso that where one of R_1 and R_2 is hydrogen the other is methyl, and pharmaceutically acceptable salts thereof where R is hydrogen.

4,432,907
DIAMINE ACID FLUORESCENT CHELATES

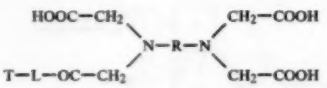
Irwin Wieder, and Robert H. Wollenberg, both of Los Altos, Calif., assignors to Analytical Radiation Corporation, Los Altos, Calif.

Division of Ser. No. 73,728, Sep. 10, 1979, Pat. No. 4,352,751. This application May 5, 1981, Ser. No. 260,574

Int. Cl.[3] **C07C** *101/26, 103/18;* **C12Q** *1/06;* **G01N** *33/52, 33/74, 33/76, 33/78, 33/92, 2/38*

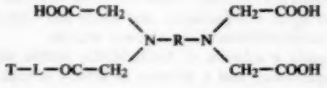
U.S. Cl. 260—429.2 **30 Claims**

1. A metal chelate for use in the fluorometric quantification of a biologically active organic species comprising an essentially 1:1 molar chelate complex of a rare earth metal ion capable of forming a fluorescent complex with a species-linked diamine triacetic acid having the structural formula:



wherein R is a two to eight atom long covalent bridge selected from carbon-oxygen ether bridges, carbon-nitrogen secondary and tertiary amide bridges and carbon-carbon alkylene, cycloalkylene and arylene bridges, T is the biologically active organic species to be fluorometrically quantified, T being other than an aliphatic mono- or polyamine, or aliphatic mono- or polyol, but comprising at least one originally present or added primary amine, secondary amine, thiol or hydroxyl functional group, and L is said at least one functional group in deprotonated form covalently bonding T to the indicated carbonyl carbon of the diamine triacetic acid.

17. An activated fluorescent rare earth metal ion chelate combination for use in the fluorometric quantification of a biologically active organic species comprising an essentially 1:1 molar chelate complex of a rare earth metal ion capable of forming a fluorescent complex with a species-linked diamine triacetic acid having the structural formula:

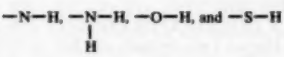


wherein R is a two to eight atom long covalent bridge selected from carbon-oxygen ether bridges, carbon-nitrogen secondary and tertiary amide bridges and carbon-carbon alkylene, cyclo-

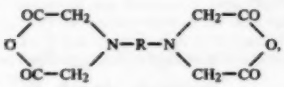
alkylene and arylene bridges, T is the biologically active organic species to be fluorometrically quantified, T being other than an aliphatic mono- or polyamine, or aliphatic mono- or polyol, but comprising at least one originally present or added primary amine, secondary amine, thiol or hydroxyl functional group, and L is said at least one functional group in deprotonated form covalently bonding T to the indicated carbonyl carbon of the diamine triacetic acid in combination with a fluorescent excitation efficiency promoter.

30. The process for preparing a fluorescent species-linked diamine triacetic acid which comprises the steps of

a. contacting in liquid phase a biologically active organic species molecule having a functional group selected from



but being other than an aliphatic mono- or polyamine, or an aliphatic mono- or polyol with a molar excess of a diaminedianhydride of the formula



wherein R is a two to eight atom long covalent bridge selected from carbon-oxygen ether bridges, carbon-nitrogen secondary and tertiary amide bridges and carbon-carbon alkylene, cycloalkylene and arylene bridges, per mole of species molecule at a temperature of from about 5° C. to about 100° C. for from about 0.5 hours to about two days,

b. hydrolyzing the remaining anhydride groups,

c. recovering the species-linked diamine triacetic acid which is formed in step b,

d. contacting the recovered species-linked diamine triacetic acid with a solution of a rare earth metal ion capable of forming a fluorescent complex with said triacetic acid and

e. contacting said fluorescent complex with a substantial molar excess of a fluorescent excitation efficiency promoter.

4,432,908
CRYSTAL OF ENANTIOMER PAIR OF PHENYLACETIC ACID ESTER DERIVATIVE AND PROCESS FOR OBTAINING A MIXTURE OF STEREOISOMERS OF THE DERIVATIVE

Yukio Suzuki; Masahiro Hayashi, both of Osaka, and Kenzi Takuma, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 1, 1981, Ser. No. 326,317
Claims priority, application Japan, Dec. 2, 1980, 55-170473
Int. Cl.³ C07C *121/75*
U.S. Cl. 260—465 D **42 Claims**

1. A crystal of an enantiomer pair of stereoisomers of α-cyano-3-phenoxybenzyl 2-(4-chlorophenyl)isovalerate comprising (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl-)isovalerate and an enantiomer thereof, said crystal having the following crystal characteristics:

crystal system	monoclinic
lattice constant	a = 11.90 Å, b = 5.60 Å, c = 32.58 Å, β = 93.0°
space group	$P2_1/c$
density	1.28 g/cm³
number of molecules in unit lattice	4

2. A process for preparing a mixture of stereoisomers of a α-cyano-3-phenoxybenzyl 2-(4-chlorophenyl)-isovalerate which consists essentially of a Y-isomer that is an enantiomer pair of (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl-)isovalerate and an enantiomer thereof, or which is rich in said Y-isomer, the process comprising depositing a crystal of said Y-isomer from a solution of α-cyano-3-phenoxybenzyl 2-(4-chlorophenyl)isovalerate in the presence or absence of a basic catalyst, said crystal having the following crystal characteristics:

crystal system	monoclinic
lattice constant	a = 11.90 Å, b = 5.60 Å, c = 32.58 Å, β = 93.0°
space group	$P2_1/c$
density	1.28 g/cm³
number of molecules in a unit lattice	4

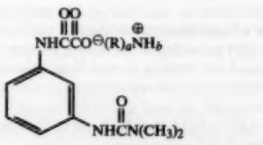
wherein the crystallization is carried out in the presence of a crystal of said Y-isomer having said crystal characteristics as a seed crystal.

4,432,909
AMINE OXANILIC ACID SALTS AS HERBICIDE EXTENDERS

Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 243,008, Mar. 12, 1981, Pat. No. 4,380,467.
This application Dec. 27, 1982, Ser. No. 453,086
Int. Cl.³ C07C *127/19*
U.S. Cl. 260—501.11 **4 Claims**

1. A compound having the formula



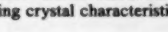
in which R is selected from the group consisting of C_1–C_6 alkyl, C_2–C_6 alkenyl, phenyl, and benzyl, and a and b are both integers from zero to four such that the sum of a and b is four.

4,432,910
PREPARATION OF PIVALOYL CYANIDE

Kurt Findeisen, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,042
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045181
Int. Cl.³ C07C *120/00*
U.S. Cl. 260—545 R **7 Claims**

1. In the preparation of pivaloyl cyanide of the formula



by reaction of pivalic acid anhydride with anhydrous hydrocyanic acid, the improvement which consists essentially of carrying out the reaction continuously in the presence of a catalyst comprising an alkali metal/copper cyanide complex or an alkaline earth metal/copper cyanide complex, and in the presence of an inert, aprotic organic diluent, which boils above about 210° C., at a temperature between about 180° and 240° C., by simultaneously and continuously dropping the pivalic acid anhydride and introducing the hydrocyanic acid in gaseous form into a stirred suspension of the catalyst in the diluent, and continuously distilling the crude product mixture consisting essentially of pivaloyl cyanide, pivalic acid and unreacted hydrocyanic acid, the unreacted hydrocyanic acid being sepa-

rated off by evaporation and being recycled to the reaction vessel, and the pivaloyl cyanide being separated from the precipitated crude product mixture by fractional distillation in vacuo.

4,432,911

VARIABLE VENTURI CARBURETOR

Satomi Wada, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Japan

Filed Apr. 28, 1982, Ser. No. 372,862
Claims priority, application Japan, Jun. 10, 1981, 56-89892
Int. Cl.³ F02M 9/06
U.S. Cl. 261—44 C **7 Claims**

1. In combination with a variable venturi carburetor for an internal combustion engine having a float chamber,

an air intake passage,

a venturi portion provided in said air intake passage,

a fuel passage communicating with said float chamber and said venturi portion,

a fuel jet provided in said fuel passage,

a suction piston adapted for reciprocation across said venturi portion in response to the load conditions of the engine,

and a fuel metering needle fixed to a bottom end of said suction piston at its base portion for controlling an annular opening area of a fuel metering portion of said fuel jet by the reciprocation of a free end of said needle;

the improvement comprising a fuel bypass duct provided above said fuel passage and adapted for bypassing said fuel jet to communicate between upstream and downstream positions of said fuel passage,

said fuel bypass duct having a calibrated jet nozzle at its outlet, said fuel jet being formed in substantially hollow cylindrical configuration,

a slit provided on said fuel jet and oriented for leading to an inlet of said fuel bypass duct,

a fuel inlet provided at the lower portion of said fuel jet and adapted for leading to said float chamber,

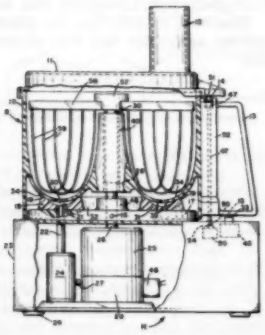
and a bubble well provided between the outer circumference of said fuel jet and the inner circumference of said fuel passage and adapted for leading from said slit to said inlet of said fuel bypass duct.

4,432,912

FOOD PROCESSOR WITH AIR WHIPPING CAPABILITY

Robert M. Berler, 3 Bruce La., Westport, Conn. 06880

Filed Jan. 28, 1982, Ser. No. 343,671
Int. Cl.³ B01F 3/04
U.S. Cl. 261—93 **9 Claims**



1. In a food processor comprising a base which houses a drive motor, a removable bowl which is mounted on said base for containing the food, a removable cover for said bowl, and a rotatable element mounted on an implement drive shaft which passes through the center of said bowl and is rotated by said motor, the improvement comprising:

(a) modifying said base so that it accomodates a modified bowl, said modified bowl being provided with a plurality of small holes through the bottom of the bowl to admit air into the bowl,

(b) a source of air on said base to supply air to said bowl,

(c) means to supply air to said bowl from said air source when said bowl is positioned on the base,

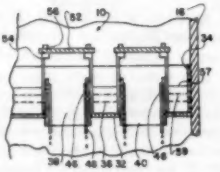
(d) a whisk element positioned in, and extending to the bottom of the bowl and means to rotate said whisk as air is being admitted to said bowl.

4,432,913

LIQUID DISTRIBUTING APPARATUS AND METHOD FOR A LIQUID-VAPOR CONTACT COLUMN

Stephen M. Harper, Lake Jackson, and Jeffrey H. Stultz, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 298,058, Aug. 31, 1981, abandoned. This application Feb. 23, 1983, Ser. No. 469,077
Int. Cl.³ B01F 3/04
U.S. Cl. 261—97 **2 Claims**



1. A plate-type liquid distributor for use in a liquid-vapor contact tower wherein it is desired to uniformly distribute liquid across a horizontal cross-section of the tower while allowing vapor to rise through spaced vapor ducts situated in vapor openings in the pan of the apparatus, which apparatus comprises:

a plate which is horizontal when installed in the tower, said plate having a plurality of spaced openings passing through it to provide for upward passage of vapors rising in a tower;

an upstanding flange sealably attached to the periphery of the horizontal plate and extending above the plate;

a vertical duct member located in each opening of the horizontal plate, said duct members being open at top and bottom to allow upward passage of vapors through the apparatus, said vertical duct members being sealably attached to the horizontal plate member with the duct member's sides extending a distance far enough above said horizontal plate to define a liquid reservoir space above the plate between the outsides of the duct walls and the inside of the upstanding flange;

said duct walls having a plurality of openings in them located at the same distance above the plate to allow a liquid to accumulate in said reservoir and to pass out of the reservoir in streamlets through the openings in said duct walls while allowing most sediment contained in the liquid to settle to the bottom of said reservoir to greatly reduce the risk of plugging the openings with sediment and consequently upsetting the liquid distribution pattern designed for the distributor apparatus, said openings being spaced apart at a substantially uniform distance, the tops of said openings being located below the tops of the duct walls as well as below the top of the upstanding flange so that a liquid pool is capable of being maintained in said reservoir space with the pool's upper surface being capable of being situated above the tops of said openings, said openings being small enough in size so as to cause a liquid slowly flowing through them under normal operating conditions

in a tower to form a pool in said reservoir space with the pool's upper surface being situated above the tops of said openings in order that any flotating debris in the liquid will remain above said openings so as to further reduce the risk of plugging the small openings and upsetting the flow distribution pattern;

said duct members' vertical sides also extending below the horizontal plate member so that liquid flowing down the side walls can have no opportunity to transfer from the side wall to the bottom of the plate member and fall from it in an indiscriminate maldistributed manner;

a multiplicity of substantially parallel, substantially vertically oriented drip rods attached to the inside of the ducts, that is the vapor side of the duct walls, in such a fashion so that substantially all of the openings have a pair of drip rods associated with it, one drip rod being adjacent to an opening on one side of that opening and the other drip rod being adjacent that opening on the opposite side of that opening so as to form an "equidistant channel" between the two drip rods of the drip rod pair below the opening; and

said drip rods extending below the bottom of the duct walls so that liquid emerging from the opening between will gravity flow downwardly in the "equidistant channel", past the bottom of said horizontal plate, and on downwardly and off the bottom ends of the drip rods into the tower section below the drip rods in the same distribution pattern as is the distribution pattern of the bottom ends of the drip rods.

4,432,914

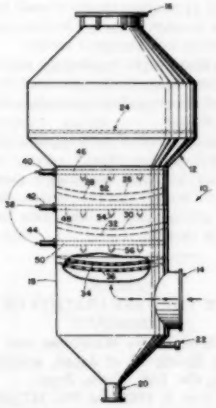
MASS TRANSFER CONTACT APPARATUS

Kenneth C. Schifftner, Danbury, Conn., assignor to Kenneth C. Schifftner, Inc., Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 391,139, Jun. 23, 1982, abandoned. This application May 19, 1983, Ser. No. 496,054

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—111 **10 Claims**



1. A gas-liquid contact apparatus comprising a housing member including an inlet and outlet and interconnecting ductwork between said inlet and outlet characterized by:

(a) at least one grid member suspended within said ductwork, the grid member disposed perpendicular to the direction of the flow of gas at said grid member; and

(b) means for dispensing a selected flow rate (L) of liquid onto said grid member(s),

said grid member(s) constructed, having a cross sectional profile ideally equal to the sum of the predetermined theoretical velocity pressure profile of the gas flowing in said interconnecting ductwork and the static and dynamic head of the dispensed liquid, said liquid dispensed onto the concave side of said grid member, said selected liquid flow rate (L) for a given average gas velocity at least sufficient to result in a controlled fluidization bed above the concave side of said grid member.

4,432,915

METHOD FOR PRODUCING NUCLEAR FUEL PELLETS, AND PRODUCT THEREOF

Timothy J. Gallivan, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 22, 1982, Ser. No. 360,630

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 **21 Claims**

1. A method for producing fissionable nuclear fuel pellets containing uranium oxide, comprising the steps of:

(a) admixing a powdered nuclear fuel material containing uranium oxide with a fugitive binder comprising a polyfunctional acid having both an organic acid group and an alcohol group to provide a substantially uniform dispersion of said binder within the powdered nuclear fuel material; and

(b) forming the resulting admixture by pressing into a coherent body.

4,432,916

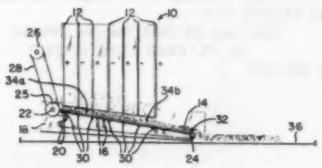
METHOD AND APPARATUS FOR THE ELECTROSTATIC ORIENTATION OF PARTICULATE MATERIALS

James D. Logan, Whitman County, Wash., assignor to Morrison-Knudsen Forest Products Company, Inc., Boise, Id.

Filed Jan. 15, 1982, Ser. No. 339,404

Int. Cl.³ B06B *1/02*

U.S. Cl. 264—24 **16 Claims**



1. A method of forming a mat of directionally oriented discrete pieces of material on a mat-support surface, comprising depositing a multitude of the discrete pieces of material on the mat-support surface in a mat-forming zone,

causing an electric current to flow through the deposited mat to produce a directional electric field immediately above the mat in the direction of desired orientation of the pieces, the electric field tending to cause the pieces to orient their length dimensions in the direction of the electric field, and

varying the strength of the electric field along the length of the mat-support surface in the direction of material flow thereof to achieve a desired surface potential distribution

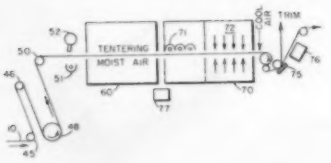
at the upper surface of the mat as the thickness of the mat being formed increases.

4,432,917

METHOD FOR IMPROVING THICKNESS UNIFORMITY OF STRETCH ORIENTED POLYACRYLONITRILE FILM

Gordon P. Hungerford, Palymra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,359
Int. Cl.³ B29D 7/24
U.S. Cl. 264—40.1 10 Claims



1. In a continuous process for producing oriented acrylonitrile polymer film by forming a polymer film strip from a hot solution of the polymer in a water soluble solvent, washing the polymer film with water or an aqueous solution to replace the solvent to form an aquagel film, stretching the aquagel film to orient the polymer and drying the oriented polymer film to remove water; the improvement comprising:

orienting the aquagel film strip by uniform machine direction hot stretching;

treating the aquagel film strip so as to alter the water content of the aquagel across the width of the strip so as to result in predetermined regions tending to resist transverse orientation and regions tending to permit stretching to a comparatively uniform film thickness; and

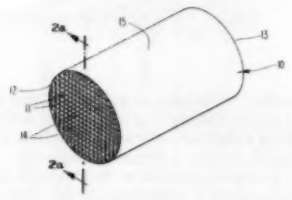
transversely stretching the treated aquagel film strip having said altered aquagel water content by transverse direction hot stretching of the strip to yield a film of comparatively uniform thickness.

4,432,918

METHODS FOR FABRICATING SELECTIVELY PLUGGED HONEYCOMB STRUCTURES

Robert J. Paisley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,611
Int. Cl.³ C04B 37/00, 41/24
U.S. Cl. 264—43 12 Claims



1. A method for selectively plugging with a final sealing material a subset of a multiplicity of cells through a honeycomb structure comprising the steps of:

providing plugs of a sinterable material in one end portion of each of said multiplicity of cells;

removing the plugs of sinterable material from the one end portion of all but said subset of said multiplicity of cells; and

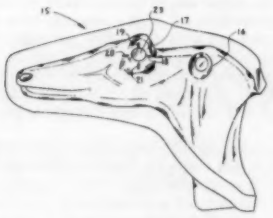
firing the honeycomb structure to sinter the plugs.

4,432,919

METHOD OF MAKING A COMPOSITE FOAM TAXIDERMY MANNIKIN

John R. Rinehart, 3232 McCormick Dr., Janesville, Wis. 53545

Filed Mar. 29, 1982, Ser. No. 363,263
Int. Cl.³ B29D 27/00
U.S. Cl. 264—46.4 6 Claims



1. The method of making a taxidermy animal head mannikin having elongated pupil artificial eyes properly positioned thereon and surrounded immediately by proper anatomical features, comprising:

providing a mold comprising a pair of mirror-image left and right half parts, each of which has a cavity surface contoured for correct anatomical formation of all features of half of the mannikin including the features immediately surrounding the eye; a semi-spherical eye socket recess in the cavity surface for snugly receiving the front portion of the eye; and reference indicia on the cavity surface near the edge of the eye socket recess including at least two indicia markings on opposite sides of the eye socket recess;

inserting into the eye socket recess of each half part of the mold the front portion of an eye leaving the rear portion thereof projecting into the mold cavity;

rotating the eye into proper position by orienting the elongated pupil with respect to the reference indicia such that the long axis of the elongated eye pupil is aligned with the two indicia markings;

closing the left and right half parts together to form the full mold cavity therebetween; and

introducing liquid foamable hardenable material into the mold cavity to foam expand and harden, thereby forming the mannikin and locking the eyes into the mannikin in proper position therein.

4,432,920

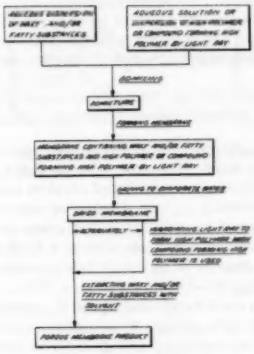
PROCESS FOR THE PREPARATION OF POROUS MEMBRANE

Norio Ishikawa, Shiga; Morio Murayama, and Yasumoto Nishijima, both of Kyoto, all of Japan, assignors to Daido-Maruta Finishing Co., Ltd., Kyoto, Japan

Filed Nov. 2, 1981, Ser. No. 317,202
Claims priority, application Japan, Nov. 7, 1980, 55-156520
Int. Cl.³ B29D 27/04
U.S. Cl. 264—49 16 Claims

1. A process for the preparation of a porous membrane having a number of uniformly distributed pores consisting essentially of the steps of preparing an aqueous dispersion system by dispersing a first material in water, said first material being selected from the group consisting of waxy substances, fatty substances, and mixture thereof and having a melting point of from the room temperature to 100° C., admixing with said aqueous dispersion system an aqueous solution or aqueous dispersion of a second material selected from the group consisting of high polymers and compounds forming high poly-

mers when irradiated by light rays, forming a membrane from the admixture, drying said membrane to evaporate water



therefrom and removing said waxy substances and said fatty substances contained in the dried membrane by extracting the same by the use of a solvent.

4,432,921

PROCESS FOR PRODUCING A BINDER FOR WOOD MATERIALS

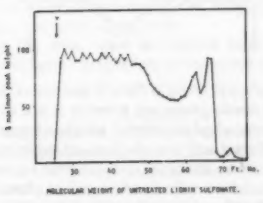
Annegret Haars, and Aloys Hüttermann, both of Göttingen, Fed. Rep. of Germany, assignors to Gesellschaft für Biotechnologische Forschung, Braunschweig, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,174

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037992

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—109 **6 Claims**



1. A process for producing an active binder for wood products from a phenolic compound having phenolic groups, including lignin sulfonate, comprising: treating said phenolic compound with enzymes to activate and oxidatively polymerize said phenolic compound by a radical mechanism to convert said phenolic compound into an active binder for wood products, permitting said active binder to bond wood products at predetermined temperature and predetermined applied pressure.

4,432,922

PROCESS FOR MOLDING A BRAKE LINING FRICTION PRODUCT

Edward R. Kaufman, Andover; Gregory R. Benson, Dracut, and Alfred Shaines, Waban, all of Mass., assignors to Glennco Trust, Lawrence, Mass.

Division of Ser. No. 402,835, Jul. 29, 1982, Pat. No. 4,388,423, which is a continuation of Ser. No. 316,784, Nov. 2, 1981, abandoned. This application Mar. 15, 1983, Ser. No. 475,497

Int. Cl.³ D04H *3/16*

U.S. Cl. 264—119 **2 Claims**

1. A process for molding an asbestos-free brake lining product, comprising:

(a) blending particles of an expanded vermiculite, an uncured thermosetting resin bonding agent, and an asbestos-free filler to form a uniform mixture;

(b) placing said mixture within a mold having a cavity shape approximately that of the desired product;

(c) compressing said mixture in said mold cavity at about room temperature and at a pressure of about 300 to 5500 p.s.i.g. for at least 2 seconds, to initially bond the particles into a preform;

(d) removing said preform from said mold and placing said preform within the cavity of a second mold having the shape of the desired product; and

(e) hot-pressing said preform in said second mold at a pressure of about 1500 to 2500 p.s.i.g. and at a temperature of about 280° F. to 360° F. for 2 to 14 minutes to cure said resin and to bond said particles of said preform to form said brake lining product.

4,432,923

PROCESS FOR THE PRODUCTION OF DRY-SPUN HOLLOW POLYACRYLONITRILE FIBERS AND FILAMENTS

Ulrich Reinehr; Toni Herbertz; Hermann-Josef Jungverdorben, all of Dormagen, and Hans K. Burghartz, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,501

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125898

Int. Cl.³ D01F *6/18*

U.S. Cl. 264—206 **10 Claims**

1. A process for the production of hollow polyacrylonitrile fibers and filaments, comprising dry spinning filament-forming acrylonitrile polymers from a solution through a jet having annular jet bores in a ring, the solution having a viscosity of at least 120 falling-ball seconds, as measured at 80° C., or of at least 75 falling-ball seconds, as measured at 100° C., the ring of the annular jet bores having three ring segments having a distance between one another of at most 0.2 mm, the area of the jet bores of the profiled jet being less than 0.2 mm^2 and the side width of the ring segments being at most 0.1 mm, and directing spinning air on the filaments from inside the ring in a transverse direction relative to the travel direction of the filaments as the filaments are taken off from the middle of the jet.

4,432,924

PROCESS FOR PRODUCING AN ELECTRICALLY CONDUCTIVE MONOFILAMENT

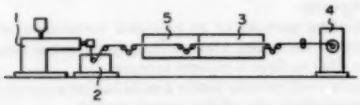
Kenji Umehara, Funabashi; Hiroshi Takeda, Narashino, and Susumu Tomidokoro, Funabashi, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 366,995

Claims priority, application Japan, Apr. 10, 1981, 56-54082; Jun. 12, 1981, 56-90302

Int. Cl.³ D01D 5/12

U.S. Cl. 264—210.8 **3 Claims**



1. A process for producing an electrically conductive thermoplastic resin monofilament containing an electrically conductive carbon black through extrusion, cooling, and orientation steps, wherein the temperature of the monofilament in the orientation step is within the range of from 60° C. less than to 5° C. less than the melting point of the thermoplastic resin, and orientation is carried out at a stretching strain rate of 5000%/min or less.

4,432,925

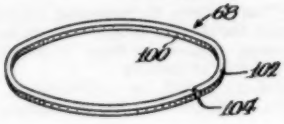
COMPOSITE PISTON RING AND PROCESS

Matthew W. Holtzberg, Ringwood, N.J., and Lawrence D. Spaulding, Naperville, Ill., assignors to Standard Oil Company, (Indiana), Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,363

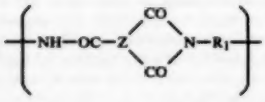
Int. Cl.³ F16J 9/28

U.S. Cl. 264—235 **26 Claims**



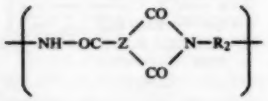
1. A composite engine part comprising:

a thermoplastic, amide-imide resinous polymeric piston ring having an inner piston-engaging surface for snap-fitting interlocking engagement with a piston and an outer bearing surface for reciprocatingly sliding against a wall of an engine cylinder, said thermoplastic piston ring providing an oil and exhaust gas-impervious barrier and seal between said piston and said cylinder wall for substantially preventing passage of oil and gas exhaust gases therethrough, said piston ring defining a generally radial access opening, said piston-engaging surface having a diameter slightly smaller than the groove-defining piston surface on which it fits, said piston ring comprising a reaction product of a trifunctional carboxylic acid compound and at least one diprimary aromatic diamine, said piston ring further comprising at least one of the following moieties:



and

-continued



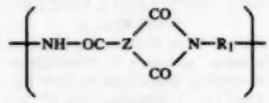
wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit, and said amide-imide resinous polymeric piston ring comprising at least one of said moieties substantially maintaining its shape and structural integrity at engine operating conditions.

16. A process for forming a composite piston ring for use in an engine, comprising the steps of:

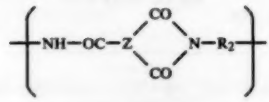
molding a thermoplastic amide-imide resinous polymer to form a piston ring having an inner piston-engaging surface for snap fitting interlocking engagement with a piston and an outer bearing surface for reciprocatingly sliding against a wall of an engine cylinder;

preparing said amide-imide polymer by reacting a trifunctional carboxylic acid compound with at least one diprimary aromatic diamine;

said amide-imide polymer comprising one of the following moieties:



and



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit;

allowing said molded piston ring to cool below its plastic deformation temperature; and

post curing said piston ring by solid state polymerization to enhance the strength and integrity of said piston ring.

4,432,926
METHOD AND APPARATUS FOR IMPARTING TWO-WAY PROPERTIES TO FLEXIBLE WEBS

Jan van Tilburg, deceased, late of London, England, by Yolande Eve van Tilburg, London, England, administrator

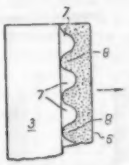
PCT No. PCT/GB80/00202, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01426, PCT Pub. Date May 28, 1981

PCT Filed Nov. 24, 1980, Ser. No. 287,729

Claims priority, application United Kingdom, Nov. 23, 1979, 7940516

Int. Cl.³ B29C *17/00*; D06C *21/00*

U.S. Cl. 264—282 **15 Claims**



1. A method of treating a flexible web to uniquely compress the web and thereby impart a two way stretch to the web, said method comprising:

(a) continuously driving a web longitudinally in and through a retarding treatment zone;

(b) compressing the web in a retarding treatment zone between a pair of opposed surfaces, at least one of which is rough with respect to the other;

(c) withdrawing the web in a longitudinal direction while restraining alternately spaced portions of the web to create a stretch property in the web that is transverse to the longitudinal direction;

whereby the web, when withdrawn from the restraining area, will have a unique two dimensional stretch property.

7. An apparatus for treating a flexible web to uniquely compress the web and thereby impart a two way stretch to the web, said apparatus comprising:

(a) a retarding treatment zone defined by closely spaced opposed surfaces, at least one of which is stationary for retardingly engaging the flexible web as it passes through the treatment zone;

(b) a drive means for continuously advancing a longitudinal and flexible web into and through the retarding treatment zone;

(c) means for restraining periodically spaced portions of the web as it is withdrawn from the retarding treatment zone, said spaced portions being spaced transverse to the longitudinal dimension of the web;

whereby the web, when withdrawn from the restraining area will have a unique two dimensional stretch property.

4,432,927
CREPING MACHINE AND METHOD

Jan van Tilburg, deceased, late of London, England, and by Yolande E. van Tilburg, administrator, 6 Clarendon Gardens, London W9 1A1 England

PCT No. PCT/GB80/00109, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/00082, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 30, 1980, Ser. No. 243,945

Claims priority, application United Kingdom, Jun. 28, 1979, 7922445

Int. Cl.³ B31F *1/14*; D06C *21/00*

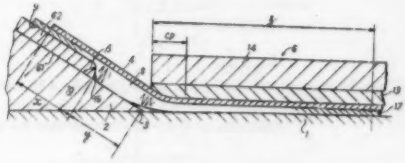
U.S. Cl. 264—282 **10 Claims**

1. A creping machine for high speed microcreping sheet material, said machine comprising:

(a) a single carrier roll which is driven, said roll having a circumferential surface for advancing the sheet material;

(b) a stationary blade assembly positioned to press sheet material into entrained engagement with the circumferential surface of the carrier roll;

(c) a stationary retarder mounted downstream from a point of contact with the circumferential surface of the carrier roll, said retarder removing said sheet material from its entrained engagement with said carrier roll, said retarder having a discharge plane over which the sheet material



passes after disengagement from said circumferential surface;

(d) a single transverse upstream facing wall, said wall defining an angle of 60° to 120° from the discharge plane of said retarder;

(e) a resilient spring blade mounted in said stationary blade assembly, said spring blade projecting downstream from said assembly at least as far as said upstanding wall;

whereby said roll, said wall and said spring blade define a creping zone therebetween for microcreping sheet material.

4,432,928
PROCESS OF MOULDING FILLED CURABLE COMPOSITIONS

John Barnard, Letchworth, and Sandor Z. M. Padanyi, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 5, 1982, Ser. No. 375,221

Claims priority, application United Kingdom, May 14, 1981, 8114968

Int. Cl.³ B29F *1/08*

U.S. Cl. 264—519 **6 Claims**

1. A method of moulding a shaped articled from a filled, curable composition having a viscosity of less than 50 poise at the temperature at which the composition is to be moulded and containing at least 20% by volume of a finely divided filler in which the composition is cured in a mould comprising at least two mould parts defining a cavity at least one of said mould parts being at a temperature of at least 70° C. wherein prior to introducing the curable composition into the mould cavity, the pressure inside the cavity is increased above atmospheric pressure, the dispersion is injected into the mould against this pressure and is subsequently cured.

4,432,929
PULSED NEUTRON GENERATOR TUBE POWER CONTROL CIRCUIT

James R. Bridges, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 17, 1981, Ser. No. 284,297

Int. Cl.³ G21G *4/02*

U.S. Cl. 376—119 **12 Claims**

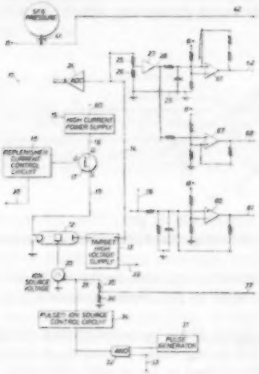
1. A protective system to be used with a neutron generator tube having an ion source, a target and a replenisher in well logging apparatus wherein the tube operates with a high voltage supply for keeping the target at high voltage, a replenisher current in a specified range, an ion source, and wherein a target current of a specified value in said generator tube is desired for efficient operation of said tube, the apparatus comprising:

(a) first means for monitoring target current in said generator tube and for generating a signal representative thereof;

(b) second means for monitoring ion source pulses in said generator tube and forming a signal representative thereof;

(c) third means for monitoring replenisher current flow in said generator tube and forming a signal representative thereof; and

(d) fourth means responsive to signals from said first, second and third means for enabling application of high voltage



power to the neutron tube to activate said neutron generator tube to an operative state, said fourth means continuing in operation in response to said first, second and third signals input thereto for the duration of operation of the neutron tube, and additionally forming enable signals indicative of the continued operation of the neutron tube within specified limits for input to said high voltage supply.

4,432,930

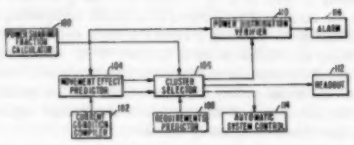
SPECTRAL SHIFT REACTOR CONTROL METHOD

Albert J. Impink, Jr., Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1980, Ser. No. 217,054

Int. Cl.³ G21C *7/00*

U.S. Cl. 376—215 **6 Claims**



1. A method of operating a nuclear reactor comprising:

determining the current power density of each core zone;

predicting the anticipated reactivity change of each of said core zones after movement of the corresponding reactor coolant displacer elements, based on the equation

$$\Delta R = K \times BU \times APD$$

where

ΔR = reactivity change of the core zone resulting from the movement of the corresponding displacer element;

APD = core zone power density before movement of the corresponding displacer element;

BU = burnup in MWD/MTU; and

K = a constant;

determining the reactivity change needed to achieve the desired reactor core power level;

selecting an appropriate displacer element for movement to attain the desired reactivity change; and

moving said selected displacer element relative to said core for attaining the desired reactor core power level.

4,432,931

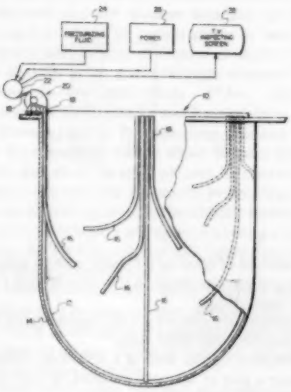
INSPECTION SYSTEM

John L. Lockett, Chatsworth, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 2, 1981, Ser. No. 307,975

Int. Cl.³ G21C *17/08*

U.S. Cl. 376—248 **10 Claims**



1. A system for remote visual inspection of a structure comprising: a primary vessel surrounded by a containment vessel;

at least one substantially rigid fixed conduit member terminating at a first end adjacent an upper portion of said vessels and a second end adjacent an area to be inspected, said conduit member being provided with at least one aperture in the wall thereof adjacent the area to be inspected;

a housing containing a camera and a light source for insertion into said first end of said conduit member;

means for controlling the temperature of said camera; support means for said housing, said support means including at least a first hollow, flexible hose member having a first end connected to said housing and a second end attached to a spool assembly positioned adjacent said upper portion of said vessels;

means for supplying electrical power to said camera and light source and for transmitting signals from said camera;

display means for receiving signals from said camera;

pressurizing means for introducing a fluid into said flexible hose member in an amount sufficient to provide a desired amount of rigidity to the hose member to facilitate movement of said housing and hose member through the rigid fixed conduit member and;

means for driving said support means into said conduit member to position said housing adjacent the area to be inspected.

4,432,932

REACTOR HEAD SHIELDING SYSTEM

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014, assignor to Earl B. Jacobson, Crystal Lake, Ill.

Filed Nov. 10, 1980, Ser. No. 207,183

Int. Cl.³ G21C *11/00*

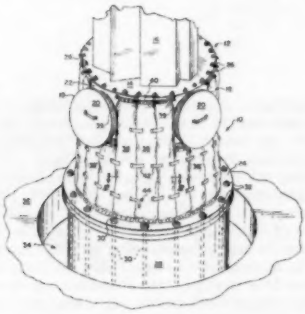
U.S. Cl. 376—287 **6 Claims**

1. A reactor head shielding system for a nuclear power

reactor head, said system comprising: a nuclear power reactor head;

a plurality of flexible shielding means secured to said reactor head in an interleaved manner to form a double layer of said shielding means at all points around the covered portion of said reactor head, said plurality of shielding means substantially covering said reactor head on at least a substantial portion around the sides of said reactor head for substantially negating radiation exposure;

each of said shield means including an offset configuration for interleaving along the length thereof with adjacent ones of said shielding means around the reactor head, said offset configuration formed by at least two sleeves secured and assembled together, each of said sleeves being secured to one another longitudinally along the length thereof to form a sealed seam therebetween and offset transversely to one another so as to enable the formation of said interleaved double layer of said shielding means at



all points around said covered portion of said reactor head when said shielding means are juxtaposed to one another and secured longitudinally to each other and to said reactor head sufficiently to substantially eliminate any direct radiation paths between said juxtaposed shielding means;

each of said sleeves including therein a pair of radiation attenuating blankets secured and assembled within an outer casing, said casings secured to one another longitudinally along the length thereof, each of said blankets and casings being secured transversely and longitudinally within its respective sleeve to eliminate any shifting and settling of radiation attenuating material when said shielding means are secured to said reactor head; and

each of said shielding means including assembly means for detachably securing said shielding means to said reactor head, said assembly means including a mounting plate and plate-type means to secure one end of each of said two sleeves to said mounting plate in said offset configuration.

4,432,933

PROCESS FOR THE FABRICATION OF THERMONUCLEAR FUEL PELLETS AND THE PRODUCT THEREOF

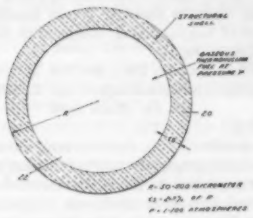
Robert J. Teitel, and David E. Solomon, both of Ann Arbor, Mich., assignors to KMS Fusion, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 339,558, Mar. 9, 1973, abandoned. This application Apr. 9, 1976, Ser. No. 675,530

Int. Cl.³ G21B *1/00*; G21C *3/04*

U.S. Cl. 376—152 **12 Claims**

1. A nuclear fuel pellet which comprises a hollow sphere having a homogeneously integral and continuous wall consisting essentially of at least one of the group of glass, ceramic, metal and plastic materials, said wall having a permeability rate for hydrogen isotopes which decreases with decreasing temperature and is sufficiently low at room temperature and one atmosphere pressure to retain within said sphere hydrogen isotopes at pressures of at least ten atmospheres, said wall of said hollow sphere having a diameter not greater than two millimeters, and a quantity of a fuel including at least one



isotope of hydrogen contained within the interior of said hollow sphere in an amount sufficient to possess a pressure of at least ten atmospheres at room temperature.

4,432,934

DISPLACER ROD FOR USE IN A MECHANICAL SPECTRAL SHIFT REACTOR

Robert K. Gjertsen, Monroeville; John F. Wilson, Murrysville, and Raymond A. George, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1980, Ser. No. 217,052

Int. Cl.³ G21C *7/26*

U.S. Cl. 376—333 **9 Claims**

1. A pressurized water nuclear reactor having low neutron absorbing displacer rods for selectively displacing reactor coolant, said displacer rods comprising:

a top end plug;

a hollow stainless steel first tube attached at one end to said top end plug;

a solid Zircaloy mid rod extension attached at one end to said first tube;

a hollow Zircaloy second tube attached at one end to said mid rod extension; and

a bottom end plug attached to said second tube for displacing said reactor coolant when inserted into the core of said reactor.

4,432,935

METHOD OF PRODUCING POROUS BODY FOR SOLID ELECTROLYTIC CAPACITOR

Yoshimi Kubo; Shigeaki Shimizu; Tetsuo Suzuki, and Hitoshi Igarashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,346
Claims priority, application Japan, Apr. 2, 1980, 55-43326
Int. Cl.³ B22B *3/16*
U.S. Cl. 419—2 2 Claims

1. A method of producing a porous body for a solid electrolytic capacitor comprising the steps of: mixing powdered titanium hydride expressed by the general formula TiH_x (where $2 \geqq x > 0.5$) and powdered aluminum, compression-molding the mixture to form an article, dehydrogenating the compression-molded article at a temperature of 400° to 500° C. for thirty to sixty minutes, subjecting the dehydrogenated, molded article to an alloying reaction at a temperature which is higher than 500° C. and below the melting point of aluminum for about one hour, and holding the alloyed article at a temperature of about 1000° for a predetermined period.

4,432,936

METHOD FOR ADDING INSOLUBLE MATERIAL TO A LIQUID OR PARTIALLY LIQUID METAL

Earl K. Keith, Clute, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 27, 1982, Ser. No. 412,349
Int. Cl.³ C22C *1/02, 32/00*
U.S. Cl. 420—590 9 Claims

1. A method for adding substantially insoluble material to an at least partially liquid metal comprising:

(a) providing combination of a first metal having discrete degenerate dendrites and a plurality of substantially insoluble particles at least partially suspended in the first metal;

(b) mixing the composite with a second metal at a temperature greater than the solidus temperature of both the first metal and the second metal, said second metal being capable of forming a dendritic structure upon cooling from a liquid state to a solid state; and

(c) solidifying the mixture into a dendritic structure having a plurality of substantially insoluble particles at least partially suspended in the structure.

4,432,937

ZINC ALLOY FOR USE WITH ELECTRODE

Kenta Kuwayama, Tokyo; Junzo Nakagawa; Keishi Tomii, both of Annaka, and Kenji Hagimori, Takasaki, all of Japan, assignors to Toho Aen Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,102
Claims priority, application Japan, Aug. 11, 1981, 56-124743
Int. Cl.³ C22C *18/00*
U.S. Cl. 420—513 4 Claims

1. A zinc alloy for use with an electrode comprising more than 0.01% of gallium and more than 0.01% of indium.

4,432,938

APPARATUS FOR CREATING A FLOW OF AIR PAST A PRODUCT CAPABLE OF BEING VAPORIZED

Murray O. Meetze, Jr., Columbia, S.C., assignor to Risdon Enterprises, Inc., Columbia, S.C.

Filed Apr. 30, 1981, Ser. No. 259,070
Int. Cl.³ A61L *9/12*
U.S. Cl. 422—49 17 Claims

1. An improved apparatus, for creating a flow of air past a product capable of being vaporized, powered by a battery having one terminal at each axially opposed end thereof; said apparatus comprising:

a housing including a plurality of exterior walls defining an enclosed interior space with an access opening into said space and further defining an air intake port, an air discharge port, and a path for flow of air between said intake and discharge ports; said housing further including means for supporting said product in said path; and

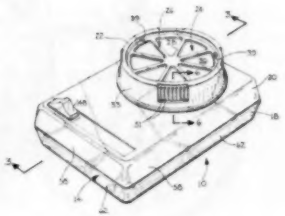
a mechanism, for creating air flow along said path, made as an integrated structure for assembly as a unit with said housing, said structurally integral mechanism including

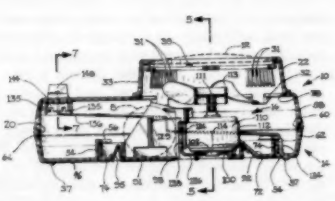
(a) a direct current electric motor having two electrical contact lugs projecting from one end thereof and a rotary shaft projecting from an opposite end thereof;

(b) a fan mounted on said shaft to be driven by said motor;

(c) two resilient wire connectors each for connecting one lug of said motor to one terminal of a battery, the resilient characteristic of said connectors providing for effective electrical contact of said lugs to the terminals of a battery without further need for additional mechanical or soldered affixing means;

and





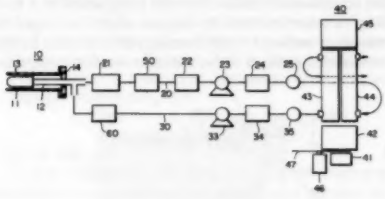
(d) a chassis comprising a base, means for mounting said motor on said base with said lugs in fixed position relative to one side of said base, a pair of partitions standing upwardly from said one side of said base and spaced by a distance slightly greater than the distance between the terminals of a battery to thereby define a battery compartment, and means for mounting each wire connector with one portion thereof resiliently urged against one lug of said motor and a second portion thereof resiliently urged to a location in said compartment for contacting one terminal of said battery; said chassis further being shaped and dimensioned to received in said access opening with the side of said base opposite said one side constituting a generally continuous extension of said exterior walls and with said motor, said fan, said connectors and said battery compartment positioned within said space and said fan located to create air flow along said path.

4,432,939

AMMONIA GAS ANALYZER

Atsuo Watanabe; Teruo Kaneko; Takeo Tanaka, and Yoshio Saito, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 3, 1981, Ser. No. 250,790
Claims priority, application Japan, Apr. 14, 1980, 55-48815; Apr. 14, 1980, 55-50358[U]
Int. Cl.³ G01N *31/10, 21/00*
U.S. Cl. 422—93 3 Claims



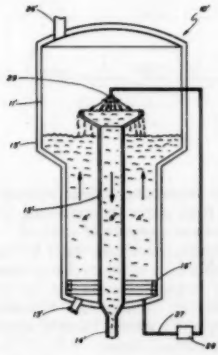
1. An ammonia gas analyzer comprising gas sampling means, a measuring gas channel connected to said gas sampling means, a comparison gas channel connected to said gas sampling means parallel to said measuring gas channel, said measuring gas channel including an NH_3/NO converter for converting NH_3 contained in a sample gas into NO and measuring means connected to said channels for measuring the concentration of NH_3 in the gas sampled by said gas sampling means by comparing the amount of NO in said measuring gas channel after conversion of the NH_3 with respect to the amount of NO in said comparison gas channel, a first sulphuric acid converter located in said comparison gas channel intermediate said sampling means and said measuring means and a second sulphuric acid converter located in said measuring gas channel intermediate said NH_3/NO converter and said measuring means for converting sulfuric compounds in said sample gas into sulfur dioxide.

4,432,940

REACTOR

Edward J. Buyalos, Chester, Va.; Hugh H. Rowan, Chapel Hill, and Steven A. Young, Cary, both of N.C.; David Pendleburg, Chester, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Corporation, Morris Township, Morris County, N.J.

Filed Mar. 15, 1982, Ser. No. 358,177
Int. Cl.³ C07C *69/82*
U.S. Cl. 422—135 6 Claims



1. In a reactor, for the continuous polymerization of feed materials to higher viscosity process fluid, comprising a vertical, hollow vessel having an inlet for the introduction of feed materials, an outlet for the discharge of process product and an exhaust for reaction vapors; means for heating the vessel; and an annular wall within the vessel attached thereto at its base and forming in conjunction therewith at least two reaction stages, the first stage being disposed between the wall and the vessel with the inlet opening thereto, the last stage being confined by the wall with the outlet discharging therefrom; the improvement comprising:

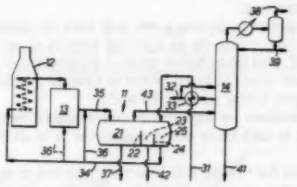
a recycle loop, connected to draw from the first stage for circulation of process fluid to be discharged just above and into the last stage by discharge means; whereby feed materials are introduced through the inlet to the first stage, circulated therefrom by the recycle loop to be discharged by discharge means just above and into the last stage, some of the process fluid in the last stage overflowing ultimately into the first stage to be recirculated and some of the process fluid in the last stage exiting to travel to the next reactor.

4,432,941

APPARATUS FOR THE DISTILLATION AND THERMAL CRACKING OF A CRUDE OIL FEEDSTOCK AND A REACTOR FOR USE THEREIN

Peter Spencer, 9 Links Close, Ashstead, Surrey, England

Filed Oct. 13, 1981, Ser. No. 311,018
Claims priority, application United Kingdom, Oct. 13, 1980, 8033027; Nov. 11, 1980, 8036126; Feb. 26, 1981, 8106098
Int. Cl.³ C10G *9/08*
U.S. Cl. 422—140 8 Claims



1. Apparatus for the distillation and thermal cracking of a crude oil feedstock, said apparatus comprising:

(a) a distillation column;

(b) a reactor comprising:

(i) an outer vessel;

(ii) an inner vessel located within said outer vessel, said inner vessel having an opening at its base to allow cracked products, including coke, to leave said inner vessel and to enter said outer vessel;

(iii) a liquid feedstock inlet in said inner vessel;

(iv) a gas outlet from said inner vessel;

(v) one or more cracked products outlets leading from said outer vessel;

(vi) a discharge port near the bottom of said outer vessel for the discharge of coke; and

(vii) means for cooling the contents of said outer vessel;

(c) a separation vessel comprising:

(i) a feedstock inlet;

(ii) a gas outlet leading to said distillation column;

(iii) a cracked products inlet leading from at least one of said one or more cracked products outlets leading from said outer vessel; and

(iv) a liquid outlet leading to said liquid feedstock inlet in said inner vessel;

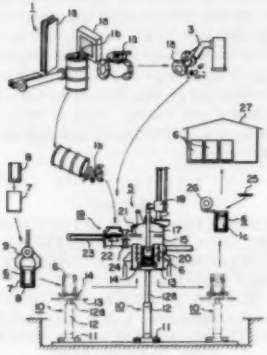
(d) means for heating liquid withdrawn from said separation vessel liquid outlet prior to entry into said inner vessel; and

(e) means for cooling cracked products withdrawn from said one of said cracked products outlets in said outer vessel prior to entry into said separation vessel.

4,432,942
APPARATUS FOR FILLING A CONTAINER WITH RADIOACTIVE SOLID WASTES

Toshio Adachi, 63 Omotedai Tenpaku-ken, Nagoya-shi, Aichi-ken, and Susumu Hiratake, 1662-9 Kizuki-cho, Kasugai-shi, Aichi-ken, both of Japan

Filed Oct. 13, 1981, Ser. No. 310,719
Claims priority, application Japan, Jan. 27, 1979, 54-8325
Int. Cl.³ G21F *9/30*
U.S. Cl. 422—159 **5 Claims**



1. An apparatus, for filling a container with radioactive waste, comprising:

(i) a furnace body having a top wall with an opening therein and a side wall with an opening therein at an upper part thereof, said body being open at its lower part,

(ii) a lower cover adapted, when in a raised position, to close said open lower part of the body,

(iii) a container on said lower cover which becomes positioned in said body when said cover is in its raised position,

(iv) means for raising and lowering said lower cover,

(v) a bucket movable through said side wall opening between a first position in which it is outside said side wall of the furnace body, and a second position in which it is located above said container in said body,

(vi) plasma torch means movable up and down through said top wall opening between a raised position in which said torch means are raised in said furnace body so that a lower end thereof becomes positioned above the level of said bucket, and a lowered position in which said lower end extends into said container when said container is positioned in said body.

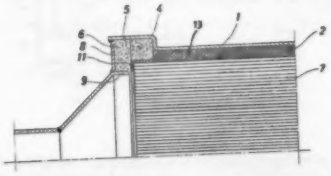
4,432,943
ELASTIC SUSPENSION FOR A MONOLITHIC CATALYST BODY IN A EXHAUST GAS CLEANING DEVICE

Reimar Musall, Burgdorf, and Wilhelm Wolsing, Hanover, both of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 376,338, Jul. 5, 1973, Pat. No. 4,328,187. This application May 19, 1975, Ser. No. 578,712
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1972, 2233886
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Int. Cl.³ F01N *3/15*; B01J *8/02*
U.S. Cl. 422—179 **14 Claims**

1. Device for the purification of waste gases of internal combustion engines comprising a housing having an inlet and an outlet and having at least one monolith through which the waste gases flow and which is disposed in said housing between said inlet and outlet, said at least one monolith having opposed end edges and having one compressed metallic body ring in contact with the side potions of the end edges absorbing radial forces and one compressed metallic body ring in contact with the end portions of the end edges absorbing axial forces, said rings being disposed at said end edges in contact with the housing, and supporting and protecting rings of thin sheet metal disposed between and in contact with said rings and said end portion edges.

3. In a catalyzer for detoxifying exhaust gases from an internal combustion engine, wherein a monolithic catalyst body having an outer surface and facing ends is supported in a housing having an inner surface, by support means arranged between said inner surface of said housing and said outer surface of said monolithic catalyst body, the improvement comprising

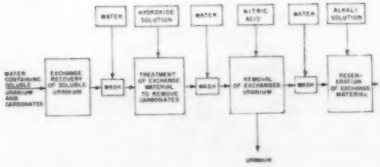


said support means comprising elastically yielding means, and holding means for locating said elastically yielding means at least partially between each facing end of said monolithic catalyst body and the inner surface of said housing, whereby the monolithic catalyst body is elastically restrained in said housing against movement in all three dimensions of space, wherein said elastically yielding means are elastically deformable, heat resistant wire mesh damping rings having an inner diameter, said holding means comprising inner supporting means located in said housing for holding said rings at the respective inner diameter thereof whereby the damping rings are securely seated on the respective inner supporting means and thus between the inner housing surface and the respective facing end of the monolithic catalyst body.

4,432,944
ION EXCHANGE RECOVERY OF URANIUM

Henry H. Elliott, Pleasanton, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Dec. 22, 1980, Ser. No. 218,351
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—7 **23 Claims**



1. A process for recovering soluble uranium with an ion exchange material from carbonate-containing water, comprising the combination and sequence of steps of:

(a) contacting carbonate-containing water having soluble uranium therein with a mass of ion exchange material charged with at least one exchangeable ion selected from the group consisting of hydroxyl, carbonate and bicarbonate ions, and thereby removing and retaining thereon uranium ions from said carbonate-containing water;

(b) treating the mass of ion exchange material having the uranium ions retained thereon by passing therethrough a solution of a hydroxide selected from the group consisting of a

metal hydroxide and ammonium hydroxide to expel any carbonate contained therein; and

(c) removing the retained ions comprising uranium from the ion exchange material by contacting said material with an acid and recovering the uranium.

4,432,945

REMOVING OXYGEN FROM A SOLVENT EXTRACTANT IN AN URANIUM RECOVERY PROCESS

Fred J. Hurst, Oak Ridge; Gilbert M. Brown, Knoxville, and Franz A. Posey, Concord, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 4, 1981, Ser. No. 318,081
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—10 **8 Claims**

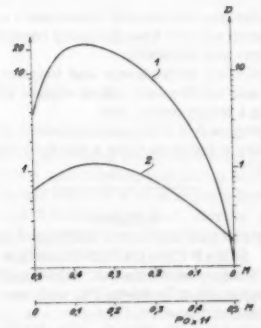
1. In a method for effecting the selective recovery of uranium from a wet-process phosphoric acid solution by solvent extraction comprising the steps of contacting said solution with an organic solvent extractant containing dissolved oxygen to extract uranium from said solution and thereafter stripping the extracted uranium from the extractant by contacting the solvent mixture with a reductive strip solution of phosphoric acid and ferrous ion; the improvement comprising sparging said extractant with a nonoxidizing gas, thereby removing sufficient deleterious dissolved oxygen therefrom prior to contact with said reductive strip solution to effectively decrease the consumption of ferrous ion in the stripping step.

4,432,946

URANIUM (VI) RECOVERY PROCESS USING ACID ORGANOPHOSPHORUS EXTRACTANT CONTAINING TWO OR FOUR ALKOXYALKYL OR ARYLOXYALKYL RADICALS

Claude Ginisty, Villeneuve-le-Roi; Michel Marteau, Ballainvilliers, and Bernard Mauborgne, Limours, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 30, 1981, Ser. No. 316,941
Claims priority, application France, Nov. 14, 1980, 80 24253
Int. Cl.³ C01G *60/02*
U.S. Cl. 423—10 **11 Claims**



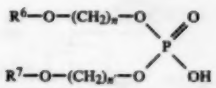
1. A process for the recovery of uranium (VI) present in a phosphoric acid solution by contacting the said solution with an organic solvent able to extract the uranium, wherein the organic solvent comprises a system of extractants respectively constituted by:

(a) a neutral phosphine oxide of the formula:

(I)

in which R^1, R^2 and R^3, are selected from the group consisting of alkyl, aryl or alkoxyalkyl radicals, and

(b) an acid organophosphorus compound of the formula



(III)

in which R^6 and R^7, which are selected from the group consisting of alkyl or aryl radicals, and n and n', which can be identical or different are numbers equal to 2 or 3.

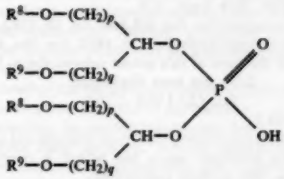
5. A process for the recovery of uranium (IV) present in a phosphoric acid solution by contacting the said solution with an organic solvent able to extract the uranium, wherein the organic solvent comprises a system of extractants respectively constituted by:

(a) a neutral phosphine oxide of the formula:

(I)

in which R^1, R^2 and R^3, are selected from the group consisting of alkyl, aryl or alkoxyalkyl radicals, and

(b) an acid organophosphorus compound of formula



(IV)

in which R^8 and R^9, are selected from the group consisting of alkyl or aryl radicals, and p and q which can be the same or different, are equal to 1 or 2.

4,432,947

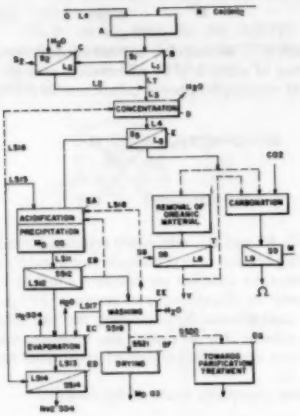
PROCESS FOR OBTAINING MOLYBDENUM AS A USEFUL PRODUCT FROM MOLYBDENIFEROUS SOLUTIONS CONTAINING ALKALI METAL CARBONATE, SULPHATE, HYDROXIDE OR HYDROGEN CARBONATE AND POSSIBLY URANIUM

Pierre Maurel, Atx-en-provence, France, assignor to Uranium Pechiney Ugine Kuhlmann, France

Filed Jul. 16, 1982, Ser. No. 398,831
Claims priority, application France, Jul. 31, 1981, 81 15244
Int. Cl.³ C01G *39/02*
U.S. Cl. 423—55 **11 Claims**

1. A process for obtaining molybdenum as a useful product from aqueous solutions to be purified, which contains, besides said molybdenum, alkali metal carbonate, sulphate, hydroxide or hydrogen carbonate, comprising adding lime to the solution for reaction at a temperature below the boiling point temperature of the solution to precipitate insoluble calcium salts as a first precipitate, separating the precipitate from the remaining alkali metal hydroxide-enriched liquor, concentrating the remaining liquor by evaporation to provide a level wherein the

alkali metal hydroxide is present in an amount up to 50% by weight to produce a second precipitate containing a mixture of alkali metal molybdate and sulphate, separating the second



precipitate, dispersing the separated precipitate mixture in an acidic aqueous liquor, heating the dispersion under pressure to cause precipitation of anhydrous MoO_3 from the remaining liquor containing alkali metal sulphate.

4,432,948

RECOVERY OF YTTRIUM AND EUROPIUM FROM CONTAMINATED SOLUTIONS

Herman R. Heytmeijer, Whippany, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 403,460, Jul. 30, 1982, Pat. No. 4,386,056. This application Oct. 20, 1982, Ser. No. 435,439
The portion of the term of this patent subsequent to May 13, 2000, has been disclaimed.
Int. Cl.³ C01F *17/00*
U.S. Cl. 423—21.5 **3 Claims**

1. A method for recovering dissolved yttrium and europium from a solution including same, but which is contaminated with other ions, said method comprising:

adding to said contaminated solution hydrogen peroxide in predetermined amount and concentration sufficient to maintain the europium ions in the trivalent state,

passing the resultant solution through a cation resin exchange column at least until the effluent yttrium and europium concentrations and contaminant concentrations are substantially the same as those in said contaminated solution,

eluting said exchange column with deionized water to remove therefrom residual contaminated solution,

stripping said exchange column by rinsing same with a predetermined amount of inorganic acid solution of sufficient strength to strip the yttrium and europium from the exchange column resin to obtain a strip solution,

rinsing said exchange column with deionized water to obtain a rinse solution,

combining said strip and rinse solutions to form a value solution,

heating said value solution to a predetermined temperature and adding thereto a predetermined amount of oxalic acid to precipitate yttrium oxalate and europium oxalate therefrom,

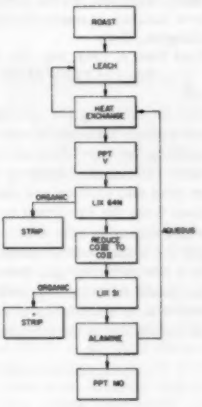
collecting said precipitate of yttrium oxalate and europium oxalate and rinsing same to remove possible residual contaminants, drying, and firing said precipitate to form the recovered yttrium oxide and europium oxide.

4,432,949

RECOVERY OF COBALT, MOLYBDENUM, NICKEL AND VANADIUM FROM AN AQUEOUS AMMONIA AND AMMONIUM SALT SOLUTION BY PRECIPITATING VANADIUM AND SUBSEQUENT SERIAL ION EXCHANGE

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,988
Int. Cl.³ C01G *39/00, 41/00, 51/00, 31/00*
U.S. Cl. 423—54 **2 Claims**



1. A process for separating metal values from an ammoniacal ammonium aqueous solution containing:

(i) vanadium;

(ii) at least one metal value selected from the group consisting of cobalt and nickel;

(iii) at least one metal value selected from the group consisting of molybdenum and tungsten; comprising the steps of:

(a) precipitating vanadium values by cooling the solution to about 0°–30° C.

(b) transferring nickel values from said solution into a first organic extractant comprising a hydroxyoxime;

(c) reducing cobalt values in said solution to the divalent state;

(d) transferring said divalent cobalt into a second organic extractant selected from the group consisting of oximes, dioximes and diketones;

(e) transferring molybdenum and tungsten metal values from said solution into a third organic extractant comprising a tetiary amine, and

(f) stripping each of said organic solutions with an aqueous stripping solution to form a metal-containing aqueous solution.

4,432,950

RECOVERY OF REFRACTORY METAL VALUES FROM SCRAP CEMENTED CARBIDE

Clarence D. Vanderpool; Richard A. Scheithauer, and Richard G. Warmington, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 16, 1982, Ser. No. 419,094
Int. Cl.³ C01G *41/00*
U.S. Cl. 423—61 **1 Claim**

1. A process for recovering refractory metal values from a tungsten carbide body cemented with a metal binder wherein said body has an aluminum oxide coating, said process comprising treating said aluminum oxide coated cemented tungsten carbide body with sulfuric acid selected from the group con-

sisting of an aqueous solution wherein said sulfuric acid is at a concentration greater than about 70 percent by weight in an aqueous solution and fuming sulfuric acid, said sulfuric acid being at a temperature of from about 130 to about 330 degrees centigrade, said treating being for a suitable period of time to form aluminum sulfate and a resulting deteriorated coating; oxidizing said cemented carbide body having a deteriorated coating in an oxygen containing atmosphere to form an oxidized product, digesting said oxidized product in an aqueous solution of sodium hydroxide to form an aqueous solution of soluble tungsten and a sludge containing metal binder values, and separating said sludge from said aqueous solution.

4,432,951

PROCESS FOR SEPARATING GERMANIUM FROM AN AQUEOUS SOLUTION

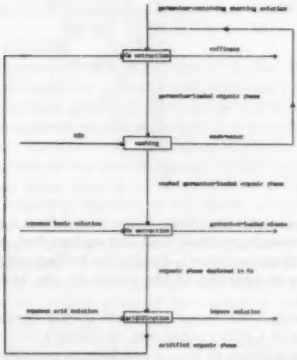
Achille De Schepper, Lichtaart-Kasterlee; Marc Coussement, Hove, and Antoine Van Peteghem, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 285,580, Jul. 21, 1981, abandoned. This application Sep. 22, 1982, Ser. No. 421,250

Claims priority, application Luxembourg, Jun. 22, 1981, 83448

Int. Cl.³ B01D *11/04*; C01G *17/00*

U.S. Cl. 423—89 **11 Claims**



1. A process for separating germanium from a germanium-containing aqueous acid solution, comprising the steps of

(a) contacting said solution with an organic liquid including a substituted 8-hydroxyquinoline, thereby producing a germanium-loaded organic phase and an aqueous phase depleted in germanium;

(b) separating said germanium-loaded organic phase from said aqueous phase depleted in germanium,

(c) contacting at a temperature above 40° C. said germanium-loaded organic phase with an aqueous basic solution, the organic phase: aqueous phase volume ratio being less than 1, thereby producing an organic phase depleted in germanium and a germanium-loaded basic aqueous phase; and

(d) separating at a temperature above 40° C. said organic phase depleted in germanium from said germanium-loaded basic aqueous phase.

4,432,952

PROCESS FOR SEPARATING GERMANIUM FROM AN AQUEOUS SOLUTION BY MEANS OF AN ALPHAHYDROXYOXIME

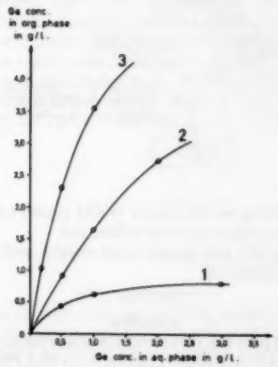
Achille De Schepper, Lichtaart-Kasterlee; Marc Coussement, Hove, and Antoine Van Peteghem, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 285,581, Jul. 21, 1981, abandoned. This application Sep. 22, 1982, Ser. No. 421,251

Claims priority, application Luxembourg, Jun. 22, 1981, 83449

Int. Cl.³ B01D *11/04*; C01G *17/00*

U.S. Cl. 423—89 **7 Claims**



1. Process for separating germanium from a germanium-containing aqueous acid solution, comprising the steps of

(a) contacting the solution with an organic liquid containing an aliphatic alpha-hydroxyoxime and a substituted 8-hydroxyquinoline, thereby producing a germanium-loaded organic phase and an aqueous phase depleted in germanium;

(b) separating the germanium-loaded organic phase from the aqueous phase depleted in germanium;

(c) contacting the germanium-loaded organic phase with an aqueous basic solution, thereby producing an organic phase depleted in germanium and a germanium-loaded basic aqueous phase; and

(d) separating the organic phase depleted in germanium from the germanium-loaded basic aqueous phase.

4,432,953

LEACHING COBALT FROM SPENT HYDROPROCESSING CATALYSTS WITH SULFUR DIOXIDE

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,813

Int. Cl.³ C01G *51/00*

U.S. Cl. 423—140 **6 Claims**

1. A process to extract cobalt from spent hydroprocessing catalyst particles comprising:

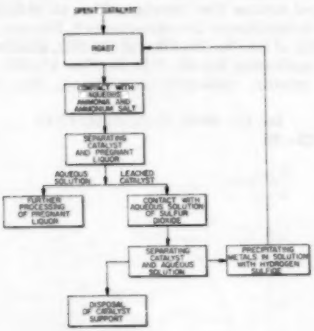
(a) roasting said catalyst particles in the atmosphere containing oxygen at a temperature in the range of between 400° C. and 600° C.;

(b) contacting said roasted catalyst particles with a first aqueous solution of ammonia and a compound selected from the group of ammonium-containing salts consisting of ammonium carbonate and ammonium sulfate, maintained at a temperature in the range of 85° C. to 95° C., in the presence of an oxygen-containing gas;

(c) separating said catalyst particles from said first aqueous solution containing cobalt values;

(d) contacting said catalyst particles with a second aqueous solution of sulfur dioxide;

(e) separating said catalyst particles from said second solution;



(f) precipitating metals present in said second solution with hydrogen sulfide as metal sulfide; and

(g) roasting said precipitated metal sulfides with fresh spent catalyst in step (a).

4,432,954

PRODUCTION OF GYPSUM HEMIHYDRATE WITH WASTE HEAT, AQUEOUS H_2SO_4 AND SULFURIC ACID SALTS

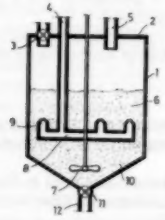
Heinrich Quante, Behringstr. 23, 4350 Recklinghausen, Fed. Rep. of Germany, assignor to Heinrich Quante, Recklinghausen, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 283,006

Claims priority, application Austria, Jul. 14, 1980, 3658/80; Fed. Rep. of Germany, Feb. 17, 1981, 3105709; May 5, 1981, 3117641

Int. Cl.³ C04B *11/00, 11/02;* **C01F** *11/46*

U.S. Cl. 423—171 **6 Claims**



1. A method of converting calcium sulfate dihydrate recovered from flue-gas desulfurization in a power plant to fine-grain calcium sulfate hemihydrate, said method comprising the steps of:

(a) heating an aqueous sulfuric-acid solution containing substantially 15 to 55% by weight sulfuric acid to a temperature such that with addition of calcium sulfate dihydrate the resulting dispersion will have a temperature above the decomposition temperature of calcium sulfate dihydrate to calcium sulfate hemihydrate;

(b) introducing into the heated sulfuric-acid solution calcium sulfate dihydrate crystals of grain size of at most 250 microns to form a dispersion containing 10 to 50% by weight of the calcium sulfate dihydrate thereof;

(c) continuously stirring the dispersion of step (b) to decompose the calcium sulfate dihydrate and precipitate fine-grain calcium sulfate hemihydrate;

(d) separating the fine-grain calcium sulfate hemihydrate formed in step (c) from the sulfuric-acid solution therein;

(e) reheating the sulfuric-acid solution separated from the calcium sulfate hemihydrate in step (d) by bubbling flue gas from said power plant through said sulfuric-acid solution to evaporate water and returning the heated solution to step (b) for further decomposition of calcium sulfate dihydrate and repeating steps (b) through (e) therewith; and

(f) drying the fine-grain calcium sulfate hemihydrate crystals separated from the solution in step (d).

4,432,955

PROCESS FOR DESORBING FISSION IODINE FROM NITRIC ACID FUEL SOLUTION

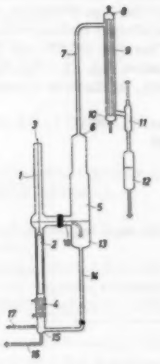
Edmund Henrich, Dettenheim, and Elmar Schlich, Linkenheim-Hochst., both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe and Nukem GmbH, Hanau, both of, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 218,193

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951339

Int. Cl.³ C01F *13/00*

U.S. Cl. 423—249 **11 Claims**



1. In a process for desorbing fission iodine from a solution in a dissolver containing nitric acid and nuclear fuel, wherein at least a part of said solution is distilled by boiling and the resulting distillate is returned to the dissolver, the improvement comprising:

(a) conducting the vapor produced during boiling of said solution in a reflux condenser, in which a portion of said vapor condenses to form a condensate, in countercurrent flow with the condensate, said condenser having parameters such that more than one theoretical stage is created in said condenser in which the distribution of iodine between the condensate and said vapor is in equilibrium;

(b) returning said condensate directly into said dissolver in order to maintain a sufficiently constant volume of said solution in said dissolver;

(c) removing said iodine from the condenser by passing through said condenser in ascending manner, a sufficient amount of a transporting gas, which includes at least a portion of said vapor, said transporting gas comprising at least one gas selected from the group consisting of water vapor, nitrogen oxides NO and NO_2, air components, and small quantities of at least one gas component selected from other noncondensable gas components and non-reactive to iodine gas components and removing the transporting gas and the gaseous iodine from the top of the condenser;

(d) adjusting the temperature at which said transporting gas is removed from said condenser to between a temperature of at least about 40° C. and a temperature below the boiling temperature of said solution determined by the operating pressure of the process;

(e) adjusting the rate and duration of the boiling of said solution during and after the dissolution of the nuclear fuel so that at least 20% by volume of said solution is converted to vapor in order to achieve the effective iodine desorption;

(f) introducing into said solution nitrogen oxides selected from the group consisting of NO_2 and mixtures of NO and NO_2 at least in the course of one to several hours toward and after the end of the dissolution, in order to reduce hard to distill and non-distillable oxidized iodine species to a distillable form; and

(g) adding to said solution toward the end of the desorption process, after the fission iodine content has dropped to several parts per thousand to several percent, inactive carrier iodine in an amount of about 5% to about 20% by weight of the total fission iodine content in the dissolved nuclear fuel, in order to accelerate the desorption of the iodine and to improve the degree of desorption.

4,432,956

PREPARATION OF MONOLITHIC SILICA AEROGELS, THE AEROGELS THUS OBTAINED AND THEIR USE FOR THE PREPARATION OF SILICA GLASS ARTICLES AND OF HEAT-INSULATING MATERIALS

Jerzy W. Zarzycki, Saint-Clement la Riviere, France; Michel Prassas, Gainesville, Fla., and Jean E. H. Phalippou, Montferrier, France, assignors to Corning France, Avon, France

Filed Jun. 1, 1982, Ser. No. 384,072

Claims priority, application France, Jun. 4, 1981, 81 11089

Int. Cl.³ C01B *33/16, 33/12*

U.S. Cl. 423—338 **10 Claims**

1. In a process for the preparation of a silica aerogel which is monolithic and free of fissures and cracks and has at least one of its dimensions greater than 10 cm, in which process water and a non-aqueous solvent are added to a hydrolyzable silicon compound, the amount of water being sufficient to hydrolyze and polycondense the said compound to form a gel, the silicon compound being present in an amount of at least 40% by volume, relative to the total of the silicon compound plus the non-aqueous solvent, the whole, placed in a container of the desired shape, is subjected, in an autoclave containing an additional amount of the non-aqueous solvent used to form the solution, to temperature and pressure conditions which are such that the critical point of the solvent of the solution remaining after gelling is exceeded, without the liquid/vapor equilibrium curve of the solvent being broken at any time, and the solvent and any residual water present are then removed in order to obtain a silica aerogel,

the improvement wherein:

(a) the water and non-aqueous solvent are added to the hydrolyzable silicon compound in such amounts that the resultant solution is homogeneous;

(b) the autoclave treatment is carried out without the prior removal of water from the gel;

(c) the autoclave is heated at a rate of at least 50° C./hour to a temperature above the critical temperature, and once the desired maximum temperature has been reached, the solvent is removed under substantially isothermal conditions, over a period of at most 5 hours; and

(d) after the autoclave has returned to atmospheric pressure, the residual solvent is purged from the autoclave, the heating of the autoclave is stopped and the aerogel is withdrawn from the autoclave after cooling.

4,432,957

METHOD OF PRODUCING SILICON CARBIDE BODIES

Ashok K. Gupta; Ernö Gyarmati, both of Jülich; Hermann Kreutz, Monchen-Gladbach; Rudolf Münzer, Alsdorf; Aristides Naoumidis, and Hubertus Nickel, both of Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 352,007

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108259

Int. Cl.³ C01B *31/36;* **C04B** *35/56*

U.S. Cl. 423—345 **6 Claims**

1. Method of making silicon carbide bodies by impregnating and siliconizing with molten silicon, or by siliconizing with gaseous silicon, a precursor carbon-containing body incorporating a coked binder, in which method there is the improvement that a carbon powder which contains at least 20% by weight of activated carbon is the starting material which together with said binder, before coking of said binder, is used for molding the carbon-containing precursor body.

4,432,958

METHOD FOR THE SELECTIVE REMOVAL AND RECOVERY OF AMMONIA FROM AMMONIA- AND HYDROGEN SULFIDE-CONTAINING GAS MIXTURES

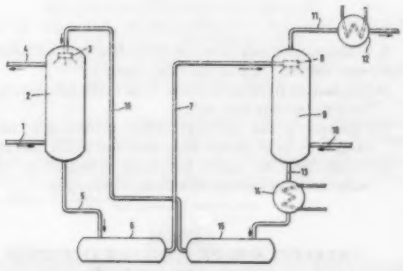
Nikolaus Schaefer, Essen; Winfried Delimaan, Kamen, and Gerd Louis, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,563

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100568

Int. Cl.³ C01C *1/02*

U.S. Cl. 423—356 **11 Claims**



1. Method for the removal and recovery of ammonia from ammonia- and hydrogen sulfide-containing gas mixtures through a washing with aqueous solutions of ammonium sulfite-bisulfite, comprising washing the gas mixture with an ammonium sulfite-bisulfite solution led in circulation, the surface tension of which solution is reduced to below 80×10^{-5} N/cm by addition of a surface active substance, to selectively wash out the ammonia, whereby the surface tension is the more reduced the more hydrogen sulfide is present in said gas mixture and the greater is the desired selectivity of ammonia washing, driving away ammonia gas from the wash solution enriched with ammonia, recovering the released ammonia, and leading the separated wash solution back into the gas wash in circulation.

4,432,959

PROCESS OF PRODUCING SODIUM CYANUARATE

Tadao Shimamura, and Naoki Kano, both of Tokushima, Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

Filed Aug. 3, 1982, Ser. No. 404,867
Int. Cl.³ C01C 3/00
U.S. Cl. 423—365 5 Claims

1. A process of producing sodium isocyanurate by reacting iso cyanuric acid in powder form with a carbonate in powder form selected from the group consisting of sodium carbonate, sodium hydrogencarbonate, and mixtures thereof, wherein at lesst one of said starting materials in powder form is a hydrate, comprising mixing the starting materials together while maintaining the same at a temperature at which free water is liberated from said hydrate.

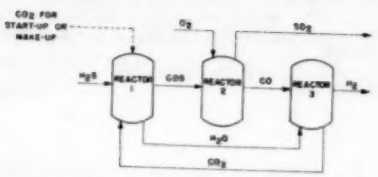
5. A process of producing sodium isocyanurate by reacting isocyanuric acid in powder form with a carbonate in powder form selected from the group consisting of sodium carbonate, sodium hydrogen carbonate and mixture thereof, wherein each of said starting materials are in the anhydrated state, comprising adding water to the anhydrates in an amount sufficient to produce hydrates thereof at room temperature, and mixing the same together at a temperature and for a time sufficient to liberate free water from said hydrates.

4,432,960

THERMOCHEMICAL METHOD FOR PRODUCING HYDROGEN FROM HYDROGEN SULFIDE

Daniel R. Herrington, Bainbridge, and Philip L. Kuch, Aurora, both of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,465
Int. Cl.³ C01B 17/50
U.S. Cl. 423—539 15 Claims



1. A thermochemical method for producing hydrogen from hydrogen sulfide, the method comprising:

(a) contacting hydrogen sulfide with carbon dioxide to form carbonyl sulfide and water,

(b) contacting the carbonyl sulfide produced in (a) with oxygen to form carbon monoxide and sulfur dioxide, and

(c) contacting the carbon monoxide produced in (b) with water to form carbon dioxide and hydrogen.

4,432,961

CATALYST AND PROCESS FOR OXIDIZING HYDROGEN SULFIDE

Robert H. Hass, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 191,864, Sep. 29, 1980, and a continuation-in-part of Ser. No. 27,033, Apr. 4, 1979. This application Dec. 30, 1981, Ser. No. 336,011
Int. Cl.³ C01B 23/14, 17/52; B01J 23/14, 29/16
U.S. Cl. 423—542 42 Claims

1. A process for oxidatively removing H_2S from a feed gas stream, said process comprising:

(1) contacting said feed gas stream in admixture with an oxidant gas comprising oxygen or SO_2 with a catalyst comprising vanadium and bismuth active catalytic components in a first reaction zone wherein a substantial proportion of said H_2S is converted to elemental sulfur at temperatures between about 250° and 475° F., but a residual proportion of H_2S remains; and

(2) contacting at least a portion of said residual H_2S, in admixture with an oxidizng gas comprising sufficient oxygen to provide an excess thereof for the conversion to SO_2, with a catalyst in a second reaction zone maintained at a temperature between about 250° and 900° F., said catalyst in said second reaction zone comprising vanadium and bismuth active catalytic components on a carrier material, said vanadium and bismuth catalytic components each being present in a proportion above about 5 percent by weight, calculated as V_2O_5 and Bi_2O_3, respectively, and said contacting in said second reaction zone being such that at least 90% of the residual H_2S contacted in said second reaction zone is converted to SO_2 without the formation of a substantial amount of SO_3.

4,432,962

METHOD FOR REMOVING HYDROGEN SULFIDE FROM GAS STREAMS

Hugh W. Gowdy, Irvine, and Donald M. Fenton, Anaheim, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 233,790, Feb. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 50,193, Jun. 20, 1979, abandoned, and Ser. No. 50,192, Jun. 20, 1979, Pat. No. 4,283,379. This application Oct. 6, 1982, Ser. No. 433,027
Int. Cl.³ C01B 17/04; B01D 53/34
U.S. Cl. 423—573 R 21 Claims

1. A method for removing hydrogen sulfide from a hydrogen sulfide-containing gas stream and converting said hydrogen sulfide to elemental sulfur, which comprises:

(a) contacting said gas stream with a regenerable quinone-containing washing solution so as to absorb said hydrogen sulfide into said washing solution, the washing solution introduced into contact with said gas stream comprising an aqueous solution having a pH between about 5 and about 10 and containing (1) solubilized vanadium, (2) one or more water-soluble quinones capable of solubilizing tetravalent vanadium, (3) one or more water-soluble non-quinone aromatic compounds capable of solubilizing tetravalent vanadium, (4) thiocyanate ions and (5) a water-soluble carboxylate complexing agent;

(b) allowing the absorbed hydrogen sulfide to react with constituents of said washing solution so as to convert said absorbed hydrogen sulfide substantially exclusively to elemental sulfur;

(c) oxidatively regenerating the washing solution from step (b) so as to form a regenerated washing solution; and

(d) separating said elemental sulfur from said washing solution.

4,432,963

RADIOGRAPHIC SCANNING AGENT

John A. Bevan, Cincinnati, Ohio, assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 929,472, Jul. 31, 1978, Pat. No. 4,247,534. This application Jan. 14, 1981, Ser. No. 225,151
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 9 Claims

1. Water-soluble stannous methanehydroxydiphosphonate.

4,432,964

TOPICAL COMPOSITION CONTAINING STEROID IN TWO FORMS RELEASED INDEPENDENTLY FROM POLYMERIC CARRIER

John W. Shell, Hillsborough, and Robert M. Gale, Mountain View, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 295,653, Aug. 24, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,358
The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.
Int. Cl.³ A61K *9/22, 9/26, 31/58*
U.S. Cl. 424—14 1 Claim

1. A topically applied composition for treating inflammation of a warm-blooded animal, wherein the composition comprises: a pair of micronized steroids consisting essentially of two topically acceptable different physical and chemical therapeutic forms of the same steroid, the pair selected from the group consisting of betamethasone, betamethasone acetate, betamethasone benzoate, betamethasone diproprionate, betamethasone valerate and betamethasone disodium diphosphate, and a bioerodible polymeric polyorthoester carrier containing from 50 nanograms to 1 gram of each therapeutic form of the micronized steroid pair, with both forms present in the bioerodible polyorthoester carrier without any interactions, and wherein, when the composition is administered topically, the composition administers the steroids by the polyorthoester bioeroding and administering the two different forms as a pair, for increasing the concentration of each steroid form topically, with the concentration of each steroid form topically applied being independent of the amount of the different steroid form topically applied for increasing the concentration of each steroid form available for passing into the tissues and steroid receptors of a warm-blooded animal in a therapeutically effective amount for treating inflammation over a prolonged period of time of 4 to 600 hours.

4,432,965

QUINIDINE SUSTAINED RELEASE DOSAGE FORMULATION

Alec D. Keith, Miami, and Charles Hsiao, Cooper City, both of Fla., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Jul. 9, 1982, Ser. No. 396,668
Int. Cl.³ A61K *9/22, 9/24, 9/32*
U.S. Cl. 424—19 4 Claims

1. A sustained release oral dosage form for providing a patient with quinidine over a prolonged period of time which comprises a tablet core containing a pharmaceutically effective amount of quinidine, said tablet core coated with a sustained release polymeric coating which contains from about 5 to about 20 percent by weight polyethylene glycol component having a molecular weight of from about 500 to about 2000, and from about 80 to about 95 percent by weight polyvinylalcohol component comprising:

(a) about one to about ten parts by weight of a partially hydrolyzed polyvinylalcohol subcomponent molecular weight of from about 50,000 to about 110,000 having a degree of hydrolysis of about 75 to about 92 percent; and

(b) about one part by weight of a substantially completely hydrolyzed polyvinylalcohol subcomponent molecular weight of from about 90,000 to about 150,000 having a degree of hydrolysis in excess of 95%.

4,432,966

COMPRESSED TABLETS FOR DISINTEGRATION IN THE COLON COMPRISING AN ACTIVE INGREDIENT CONTAINING NUCLEUS COATED WITH A FIRST LAYER CONTAINING MICROCRYSTALLINE CELLULOSE WHICH IS COATED WITH AN ENTERIC ORGANIC POLYMER COATING

Paul Zeitoun, Reims, and Patrick Brisard, Paris, both of France, assignors to Roussel-UCLAF, Romainville, France

Continuation of Ser. No. 214,413, Dec. 8, 1980, abandoned. This application Aug. 31, 1982, Ser. No. 413,483
Claims priority, application France, Dec. 8, 1980, 79 30202
Int. Cl.³ A61K *9/24, 9/36*
U.S. Cl. 424—21 7 Claims

1. A compressed tablet for oral administration and disintegration in the colon which consists essentially of:

(a) a microcrystalline cellulose-free compressed center piece containing an active agent;

(b) a first coating layer amounting to between about 0.5% and about 10% by weight of that of the center, coating the compressed center piece and consisting essentially of a mixture of a pharmaceutically acceptable lower alkyl ether of a cellulose film-forming organic polymer material which is not deteriorated by a neutral or alkaline aqueous medium, and from about 30% to about 80% by weight of the first coating layer of microcrystalline cellulose; and

(c) a second coating layer amounting to between about 2% to about 10% by weight of the center, coating the first coating layer and consisting essentially of a microcrystalline cellulose-free pharmaceutically acceptable enteric organic polymer coating material selected from the group consisting of cellulose acetylphthalate, hydroxypropylmethylcellulose phthalate, benzophenyl salicylate, cellulose acetosuccinate, copolymers of styrene and of maleic acid, formylated gelatin, salol, keratin, stearic acid, myristic acid, gluten, acrylic and methacrylic resins, and copolymers of maleic acid and phthalic acid derivatives; each of said coating layers containing a plasticizer selected from the group consisting of diethylphthalate, dibutylphthalate, propylene glycol, caster oil and mixtures thereof.

4,432,967

CONTRACEPTIVE COMPOSITION

Chester D. Szymanski, Martinsville, N.J., assignor to National Starch and Chemical Corp., Bridgewater, N.J.

Filed Jun. 25, 1982, Ser. No. 392,266
Int. Cl.³ A61K *31/74, 31/78*
U.S. Cl. 424—78 11 Claims

1. A contraceptive composition for vaginal administration which comprises an effective amount of a salt of a sulfonated homo- or copolymer of styrene and a pharmaceutically acceptable carrier, said composition being in the form of a cream, foam, jelly or suppository.

4,432,968

WEIGHT CONTROL WITH FAT IMBIBING POLYMERS

Judith L. Page; Daniel H. Haigh, both of Sanford, and James Peters, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 198,687, Oct. 20, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 313,052
Int. Cl.³ A61K *31/78, 31/74, 31/745*
U.S. Cl. 424—81 78 Claims

1. A method of controlling body weight in animals, comprising administering into the gastrointestinal tract of an animal an effective amount of a pharmacologically-acceptable, solid, particulate, crosslinked, indigestible, fat imbibing, fat retaining polymer further characterized in that it swells in liquid lard, contains less than 100 ppm of residual monomer and has a volume average particle diameter of from about 0.05 to about 2000 microns, wherein the polymer is a crosslinked copolymer of an ethylenically unsaturated monomer selected from the

group consisting of isobornyl acrylate, isobornyl methacrylate, styrene or alkylstyrene and at least one ester of a C_8 to C_{20} fatty alcohol with acrylic or methacrylic acid, crosslinked with a polyethylenically unsaturated crosslinking agent and which polymer imbibes and retains at least a portion of ingested dietary fat when the polymer is administered to the animal in a manner which results in the polymer and ingested dietary fat being in admixture in the gastrointestinal tract, whereby fat is excreted in association with the polymer.

4,432,969

PHARMACEUTICAL COMPOSITIONS

Frank R. Batchelor, Surrey, England, assignor to Beecham Group P.L.C., England

Filed Feb. 3, 1982, Ser. No. 345,534

Claims priority, application United Kingdom, Feb. 6, 1981, 8103778

Int. Cl.³ A61K *39/36*

U.S. Cl. 424—91 **10 Claims**

1. An anti-allergenic pharmaceutical composition comprising a desensitizing effective amount of an inhalent allergen and an adjuvant effective amount of a saponin adjuvant, in combination with a pharmaceutically acceptable carrier.

4,432,970

6-BETA-HALOPENICILLANIC ACID 1,1-DIOXIDES AS BETA-LACTAMASE INHIBITORS

Michael S. Kellogg, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 96,832, Nov. 23, 1979, Pat. No. 4,397,783. This application Dec. 9, 1980, Ser. No. 214,742

Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 424—114 **11 Claims**

1. (2S,5R,6R)-6-beta-Bromo-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, S,S-dioxide, or a physiologically acceptable salt thereof or a readily hydrolyzable ester thereof.

4,432,971

PHOSPHONAMIDATE COMPOUNDS

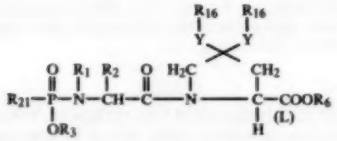
Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 289,671, Aug. 31, 1981, abandoned. This application Jun. 28, 1982, Ser. No. 392,977

Int. Cl.³ A61K *31/675, 37/00*; C07F *9/65*

U.S. Cl. 424—177 **12 Claims**

1. A compound of the formula

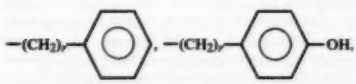


and a pharmaceutically acceptable salt thereof wherein:

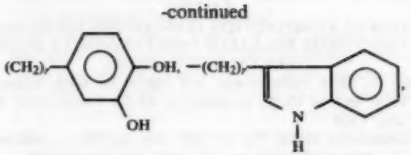
Y is oxygen or sulfur and the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

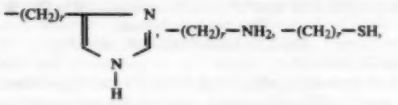
R_1 is hydrogen, lower alkyl, or cycloalkyl;

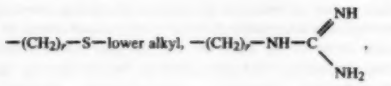
R_2 is hydrogen, lower alkyl, halo substituted lower alkyl,



-continued

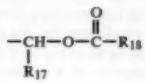




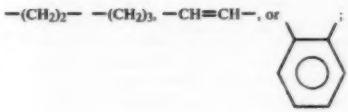


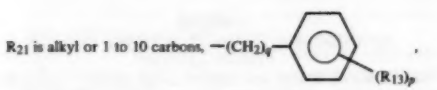
or R_1 and R_2 taken together are $-(CH_2)_n-$ wherein n is an integer from 2 to 4;

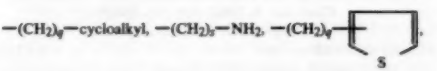
R_3 and R_6 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and

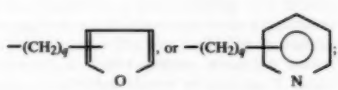


wherein R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl, and R_{18} is hydrogen, lower alkyl, lower alkoxy, phenyl or R_{17} and R_{18} taken together are









R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

r is an integer from 1 to 4;

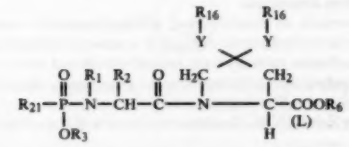
q is zero or an integer from 1 to 7;

s is an integer from 1 to 8; and

p is one, two or three provided that p is more than one only if R_{13} is hydrogen, methyl, methoxy, chloro, or fluoro.

10. A composition useful for treating hypertension in a mammalian specie comprising a pharmaceutically acceptable car-

rier and an effective amount of a hypotensive agent or pharmaceutically acceptable salt thereof of the formula



wherein R_1, R_2, R_3, R_6, R_{21}, Y, and R_{16} are as defined in claim 1.

4,432,972

PHOSPHONAMIDATE COMPOUNDS

Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

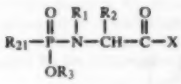
Continuation-in-part of Ser. No. 392,977, Jun. 28, 1982, which is a continuation-in-part of Ser. No. 289,671, Aug. 3, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,411

application Dec. 27, 1982, Ser. No. 453,411

Int. Cl.[3] **A61K** *37/00, 31/66;* **C07F** *9/44, 9/58*

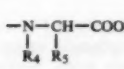
U.S. Cl. 424—177 **18 Claims**

1. A compound of the formula

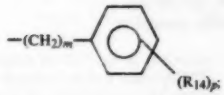


and pharmaceutically acceptable salts thereof wherein:

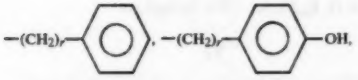
X is

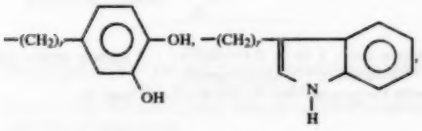


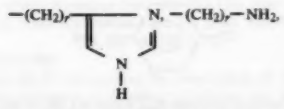
R_4 is hydrogen, lower alkyl, $-(CH_2)_m$-cycloalkyl, or



R_5 is hydrogen, lower alkyl,

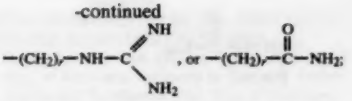






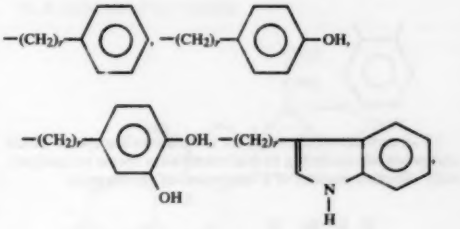
$-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl,

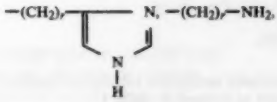
-continued

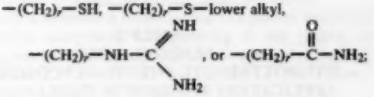


R_1 is hydrogen, lower alkyl, or cycloalkyl;

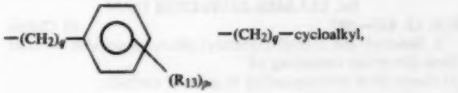
R_2 is hydrogen, lower alkyl, halo substituted lower alkyl,

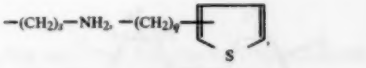


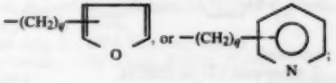




R_{21} is alkyl of 1 to 10 carbons,







R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

r is an integer from one to four;

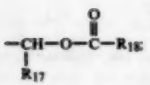
m is zero, one, two or three;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

q is zero or an integer from one to seven;

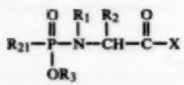
s is an integer from one to eight;

R_3 and R_6 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and



R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl; and R_{18} is hydrogen, lower alkyl, lower alkoxy, phenyl, or R_{17} and R_{18} taken together are $-(CH_2)_2-$, $(CH_2)_3$, $-CH=CH-$, or

18. A method of relieving pain in a mammalian specie which comprises administering to said mammalian specie an analgesically effective amount of a compound of the formula



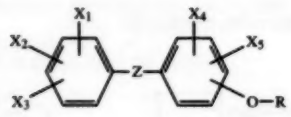
or pharmaceutically acceptable salt thereof wherein X, R_1, R_2, R_3, and R_{21} are as defined in claim **1**.

4,432,973
BENZOYL- AND α-HYDROXYBENZYL-PHENYL-GLYCOSIDES AND APPLICATION THEREOF IN THERAPEUTICS

Francois Picart, Dijon, France, assignor to Societe de Recherches Industrielles (S.O.R.I.), Paris, France

Filed Oct. 22, 1981, Ser. No. 314,032
Claims priority, application France, Oct. 29, 1980, 80 23133
Int. Cl.³ A61K *31/70;* **C07H** *15/20*
U.S. Cl. 424—180 **11 Claims**

1. Benzoyl- and α-hydroxybenzyl-phenylglycosides selected from the group consisting of:
(i) compounds corresponding to general formula:



(I)

wherein:
Z represents CO or CHOH;
X_2, X_3, X_4 and X_5, which are identical or different, each represent hydrogen, halogen, an alkyl group with 1 to 4 carbon atoms, an alkyl group with 1 to 4 carbon atoms substituted by one or more halogen atoms, an OH group, an alkoxy group with 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms substituted by one or more halogen atoms, a nitro group, a cyano group, a thiocyano group, an isothiocyano group, a NR'R" group (where R' and R", which are identical or different, each represent hydrogen or an alkyl group with 1 to 4 carbon atoms);
X_1 represents hydrogen, halogen, an alkyl group with 1 to 4 carbon atoms, an alkyl group with 1 to 4 carbon atoms substituted by one or more halogen atoms, an OH group, an alkoxy group with 1 to 4 carbon atoms, an alkoxy group with 1 to 4 carbon atoms substituted by one or more halogen atoms, a nitro group, a cyano group, a thiocyano group, an isothiocyano group, an NR'R" group (where R' and R", which are identical or different, each represent hydrogen or an alkyl group with 1 to 4 carbon atoms), an —NH—CS—O—CH_3 group or an —O—$C(CH_3)_2$DO-$_2$—R"' group (where R"' is an alkyl group with 1 to 4 carbon atoms) and
R represents an unsubstituted, non-hydrolyzable monosaccharide carbohydrate radical; or a non-hydrolyzable monosaccharide carbohydrate radical substituted with at least one substituent selected from the group consisting of acyl, alkyl and sulfonyl groups; and
(ii) when Z is CHOH, the diastereoisomers of the compounds of (i).

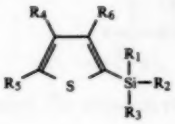
11. A therapeutic composition containing in association with a physiologically acceptable excipient, an effective ulcer treating amount of a compound according to claim **1**.

4,432,974
ANTIINFLAMMATORY AND/OR ANALGESIC 2,3-DIARYL-5-SILYL THIOPHENES

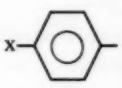
Stephen B. Haber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1982, Ser. No. 354,643
Int. Cl.³ A61K *31/38, 31/44;* **C07F** *7/08, 7/18*
U.S. Cl. 424—184 **12 Claims**

1. A compound having the formula:

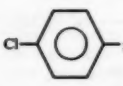


wherein
R_1, R_2 and R_3 are independently H, alkoxy of 1–2 carbon atoms, alkyl of 1–7 carbon atoms optionally substituted with halogen, alkenyl of 2–7 carbon atoms, phenyl or benzyl, with the proviso that the sum of the number of carbon atoms in R_1, R_2 and R_3 must be at least 1 and not greater than 9 with the additional proviso that no more than 2 of R_1, R_2 and R_3 are alkoxy;
R_4 and R_5 are independently pyridyl or



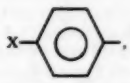
where X is H, F, Cl, R_7, OR_7, $S(O)_nR_7$ or

where n=0, 1 or 2; R_7=alkyl of 1–2 carbon atoms and R_8=alkyl of 1–2 carbon atoms;
with the proviso that R_4 and R_5 cannot both be



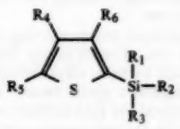
; and

with the further proviso that when R_1, R_2 or R_3 is alkoxy, both R_4 and R_5 are



then X cannot be H or R_7; and R_6 is H, or alkyl of 1–2 carbon atoms; or a pharmaceutically suitable salt thereof.

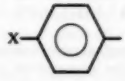
11. A method of treating inflammation, pain or both in a mammal which comprises administering to a mammal afflicted with inflammation, pain or both an effective antiinflammatory or analgesic amount of at least one compound of the formula:



wherein

R_1, R_2 and R_3 are independently H, alkoxy of 1–2 carbon atoms, alkyl of 1–7 carbon atoms optionally substituted with halogen, alkenyl of 2–7 carbon atoms, phenyl or benzyl, with the proviso that the sum of the number of carbon atoms in R_1, R_2 and R_3 must be at least 1 and not greater than 9 with the additional proviso that no more than 2 of R_1, R_2 and R_3 are alkoxy;

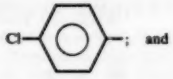
R_4 and R_5 are independently pyridyl or



where X is H, F, Cl, R_7, OR_7, $S(O)_nR_7$ or

where n=0, 1 or 2; R_7=alkyl of 1–2 carbon atoms and R_8-alkyl of 1–2 carbon atoms;

with the proviso that R_4 and R_5 cannot both be



and

R_6 is H, or alkyl of 1–2 carbon atoms; or a pharmaceutically suitable salt thereof.

4,432,975

PROCESS FOR INTRODUCING VITAMIN B-12 INTO THE BLOODSTREAM

Alfred F. Libby, Fullerton, Calif., assignor to ICN Pharmaceuticals, Inc., Covina, Calif.

Continuation-in-part of Ser. No. 253,712, Apr. 13, 1981, abandoned. This application Oct. 19, 1981, Ser. No. 312,398

Int. Cl.³ A61K *31/68*

U.S. Cl. 424—201 **13 Claims**

1. A process for enhancing the absorption of Vitamin B-12 into the bloodstream, comprising administering Vitamin B-12 sublingually as a micro-lozenge containing from about 0.1% to about 10% by weight cyanocobalamin or hydroxocobalamin.

4,432,976

CYCLOCARBONATE ESTERS OF 16α,17α, DIHYDROXY ANTI-INFLAMMATORY STEROIDS

Klaus Annen; Henry Laurent, and Helmut Hofmeister, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

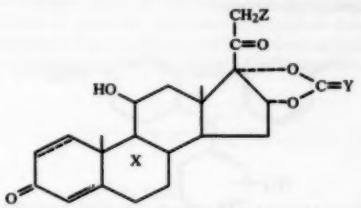
Filed Aug. 23, 1982, Ser. No. 410,756

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133631

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 **14 Claims**

1. A corticoid of the formula



wherein

is a single bond or a double bond,

X is hydrogen, fluorine, or chlorine,

Y represents an oxygen atom, and

Z is hydrogen or alkanoyloxy of 2–6 carbon atoms.

14. A method of treating inflammation in a patient in need of such treatment comprising administering to the patient an antiinflammatorily effective amount of a compound of claim **1**.

4,432,977

METHOD FOR DILATING THE SMOOTH MUSCLES OF THE UPPER URINARY TRACT

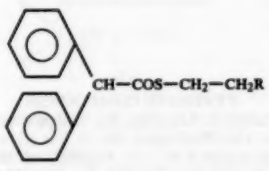
William M. Davis, Tucson, Ariz., assignor to William P. Poythress & Company, Tucson, Ariz.

Filed Aug. 27, 1982, Ser. No. 412,238

Int. Cl.³ A61K *27/00, 31/24, 31/135, 31/445*

U.S. Cl. 424—248.5 **12 Claims**

1. A method for dilating the smooth muscles of the upper urinary tract comprising administering to a patient requiring such treatment an effective amount of a di-N-substituted aminoethyl ester of diphenylthioacetic acid having the formula:



in which R represents a disubstituted amino radical of the group consisting of the diethylamino group, the morpholino group and the piperidino group.

4,432,978

HEXAHYDRO-TRANS-PYRIDOINDOLE

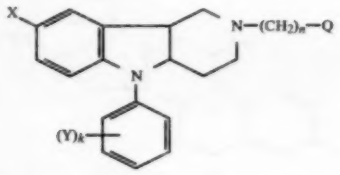
Willard M. Welch, Mystic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 259,569, Jan. 16, 1981, Pat. No. 4,337,250, which is a continuation-in-part of Ser. No. 182,177, Aug. 28, 1980, abandoned, which is a division of Ser. No. 61,573, Jul. 30, 1979, Pat. No. 4,252,811. This application May 20, 1982, Ser. No. 380,182

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/44, 31/50, 31/505*

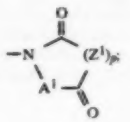
U.S. Cl. 424—249 **13 Claims**

1. A (+) enantiomeric, a mixture of (+) and (−) enantiomeric or (±) racemic 4a,9b-trans-hexahydro-1H-pyridoindole derivative of the formula



or a pharmaceutically acceptable salt thereof, wherein

Q is



k is 1 or 2;

n is 2 to 9;

X and Y are each independently H, F, Cl, Br, OCH_3, CH_3 or CH_2CH_3;

p is 0 or 1;

Z^1 is methano, ethano, etheno, o-benzeno or NR^2;

A^1 is oxygen, NR^3, methano, ethano, etheno, propano, or o-benzeno; and

R^2 and R^3 are each independently H, (C_1–C_5)alkyl of 1 to 5 carbons, phenyl, benzyl or a ring mono or disubstituted form of phenyl or benzyl, wherein the monosubstituent and each of the disubstituents is independently selected from F, Cl, Br, OCH_3, CH_3 or CH_2CH_3;

with the provisos that when A^1 is methano, oxygen or NR^3, p is 1; that when A^1 is propano, p is 0; and that when Z^1 is ethano, etheno or o-benzeno, A^1 is NR^3.

13. A method of treating psychoses and neuroses in a patient requiring major tranquilization which comprises administering to the patient by oral, intravenous, intramuscular or subcutaneous route an effective amount of a derivative of claim **1**.

4,432,979

PYRIDONE COMPOUNDS

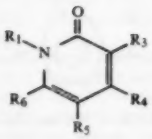
Henry F. Campbell, Lansdale, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 314,692, Oct. 26, 1981. This application Aug. 23, 1982, Ser. No. 410,645

Int. Cl.[3] **C07D** *401/04;* **A61K** *31/50, 31/505*

U.S. Cl. 424—250 **27 Claims**

1. A compound according to the formula



wherein:

R_1 is hydrogen, alkyl, hydroxyalkyl or phenloweralkyl;

R_3 is hydrogen, halo or haloalkyl;

R_4 and R_6 are each independently hydrogen or alkyl;

R_5 is a 6 membered heteroaryl ring, or a substituted 6 membered heteroaryl ring, including two nitrogen atoms in the ring; and, wherein:

substituted 6 membered heteroaryl ring means a heteroaryl group having one or more of the heteroaryl hydrogen atoms substituted by halo, alkyl, haloalkyl, hydroxyalkyl, hydroxy, alkylamino, dialkylamino, amino, acylamino, cyano or nitro; and the acid addition salts thereof.

24. A method for increasing cardiac contractility in a human or other mammal which comprises administering thereto an effective cardiotonic amount of a compound according to claim **1**.

4,432,980

PHARMACEUTICAL COMPOSITIONS

James S. Fleming, Jr., Manlius, and Joseph P. Buyniski, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 288,639, Jul. 30, 1981, Pat. No. 4,357,330. This application Aug. 19, 1982, Ser. No. 409,736

Int. Cl.[3] **A61U** *31/19, 31/505*

U.S. Cl. 424—251 **13 Claims**

1. An oral pharmaceutical composition having an inhibitory activity on blood platelet aggregation consisting essentially of anagrelide and zomepirac, wherein the weight ratio of zomepirac to anagrelide is from about 22:1 to about 178:1.

4,432,981

2-(PYRIDINYL OR HYDROXYPHENYL)-8-SUBSTITUTED PYRIDO[2,3-D]PYRIMIDIN-5(8H)-ONES

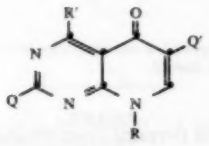
George Y. Lesher, Schodack; Baldev Singh, and Stanley C. Laskowski, both of East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,361

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 424—251 **16 Claims**

1. 2-Q-4-R′-6-Q′-8-R-pyrido[2,3-d]pyrimidin-5(8H)-one having the formula



or acid-addition salt thereof, where Q is 4(or 3)-hydroxyphenyl, 4(or 3)-methoxyphenyl, 4(or 3)-pyridinyl or 4(or 3)-pyridinyl having one or two lower-alkyl substituents, R′ is hydrogen or alkyl having from one to four carbon atoms, Q′ is hydrogen, nitro or amino, and R is alkyl having from one to four carbon atoms, $CH(C_2H_5)_2$, $(CH_2)_nCH{=}CH_2$ where n is 1 or 2, or Y—Z where Y is alkylene having from two to four carbon atoms and having its connecting linkages on different carbon atoms and Z is hydroxy, OR_1 and NR_1R_2 where R_1 and R_2 are each methyl or ethyl.

4,432,982

POLYCYCLIC COMPOUNDS SUBSTITUTED ON THE A-RING, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND METHODS OF TREATING PSORIASIS WITH THEM

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Mari Zajer nee Balazs; Lilla Forgach; Egon Karpati; Arpad Kiraly; Gyöngyver Kiraly nee Soos; Laszlo Szporny, and Bela Rosdy, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

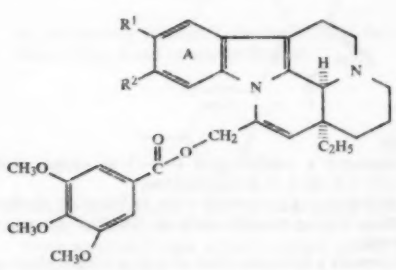
Filed Feb. 4, 1982, Ser. No. 345,633

Claims priority, application Hungary, Feb. 11, 1981, 324/81

Int. Cl.³ A61K *31/435;* C07D *461/00*

U.S. Cl. 424—256 5 Claims

1. A compound of the formula (I)



(I)

wherein

R^1 is halogen and

R^2 is hydrogen; or

R^1 is hydrogen and R^2 is halogen, or a pharmaceutically acceptable acid addition salt thereof.

4. An anti-psoriasis composition which comprises as active ingredient a pharmaceutically effective amount of the compound defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof along with a pharmaceutically acceptable inert carrier.

5. A method of treating psoriasis which comprises the step applying to the skin to be treated a pharmaceutically effective amount of the compound defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,432,983

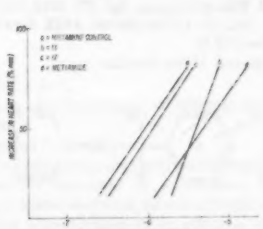
CONFORMATIONALLY RESTRICTED HISTAMINE H_2-RECEPTOR ANTAGONISTS CONTAINING A TROPANE RING

Thomas N. Riley, Oxford, Miss., and Jerry Bagley, Athens, Ga., assignors to Research Corporation, New York, N.Y.

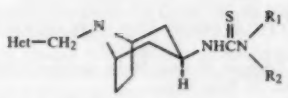
Filed Apr. 30, 1981, Ser. No. 258,922

Int. Cl.³ A01N *31/45;* C07D *451/04*

U.S. Cl. 424—265 15 Claims



1. A histamine H_2-receptor antagonist, having the formula



wherein

R_1 represents C_1–C_4 alkyl or benzyl,

R_2 represents H or C_1–C_4 alkyl, and

Het represents an imidazole ring either unsubstituted or substituted with a C_1–C_4 alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or dimethylaminomethyl group.

6. A method of inhibiting histamine H_2-receptors which comprises administering to a human or animal in need of inhibition of said receptors an effective amount of the antagonist of claim 1.

4,432,984

ANTI-HYPERTENSIVE BENZODIOXAN DERIVATIVES

Bernard Dumaitre, Bobigny; Claude Perrin, Orsay; Pierre-Jean Cornu, Paris, and Gilles Streichenberger, Neuilly-sur-Seine, all of France, assignors to Emile Bouchara, Paris, France

Continuation of Ser. No. 134,476, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 11,162, Feb. 9, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,411

Int. Cl.³ A61K *31/445;* C07D *405/06*

U.S. Cl. 424—267 5 Claims

1. A compound selected from the group consisting of 1-[(2,3-dihydro {4H} 1,4-benzodioxin) 2-yl] methyl-4-(4-fluoro-α-methyl-α-hydroxy benzyl) piperidine and a therapeutically acceptable acid addition salt thereof.

4. A method for treating hypertension in hypertensive mammals which comprises administering to said patients suffering from hypertension a safe but effective amount of a compound of claim 1.

4,432,985

N-ALKYLATED CARBOXYLIC ACID DERIVATIVES AS ANTI-CONVULSANT AGENTS

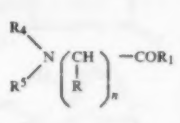
Alex M. Nadzan, Gurnee, and George R. Granneman, Lindenhurst, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 15, 1982, Ser. No. 358,167

Int. Cl.³ A61K *31/445;* C07D *211/14*

U.S. Cl. 424—267 15 Claims

7. A method of controlling convulsions or seizures comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula



wherein R is hydrogen or loweralkyl; R_1 is $—OR_2$ or $—NR_2R_3$ wherein R_2 and R_3 independently of one another denote hydrogen or loweralkyl; n is 0 or 1; R_4 and R_5 independently of one another denote loweralkyl or together with the nitrogen atom form a 5 or 6 membered saturated ring which may be substituted by loweralkyl; or a pharmaceutically acceptable salt thereof.

4,432,986

TETRAZOLES BONDED TO CERTAIN POLYCYCLIC AROMATIC SYSTEMS AND ANTI-ALLERGIC USE THEREOF

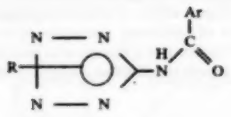
Edward H. Erickson, St. Paul, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 49,280, Jun. 18, 1979, abandoned. This application Mar. 23, 1982, Ser. No. 361,130

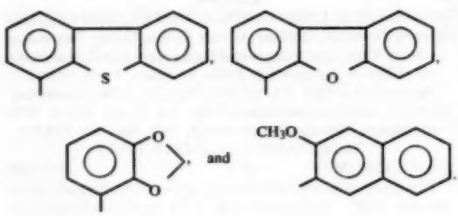
Int. Cl.³ C07D *257/02;* A61K *31/41*

U.S. Cl. 424—269 13 Claims

1. A compound of the formula



wherein R is hydrogen or lower (C_{1-4}) alkyl and Ar is selected from



4,432,987

CRYSTALLINE BENZENESULFONATE SALTS OF SULTAMICILLIN

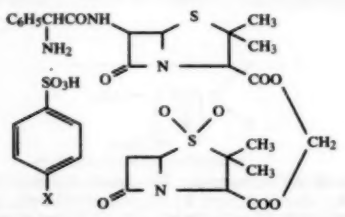
Wayne E. Barth, East Lyme, and Vytautas J. Jasys, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,156

Int. Cl.³ A61K *31/43;* C07D *499/32*

U.S. Cl. 424—271 8 Claims

1. A benzenesulfonic acid addition salt of sultamicillin of the formula



and hydrated forms thereof, wherein X is hydrogen or chloro.

7. A method of treating a bacterial infection in a mammalian subject, which comprises administering thereto an antibacterially effective amount of a compound according to claim 1.

4,432,988

ANTI-THROMBOTIC DIAZABICYCLOÖCTANEDIONES

Clifford J. Harris, Orpington, and Paul Barraclough, Maidstone, both of England, assignors to The Wellcome Foundation Ltd., United Kingdom

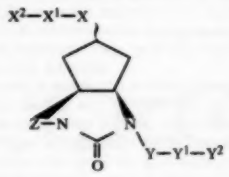
Filed Aug. 25, 1981, Ser. No. 296,138

Claims priority, application United Kingdom, Aug. 26, 1980, 8027561

Int. Cl.³ A61K *31/415;* C07D *235/02*

U.S. Cl. 424—273 R 12 Claims

1. A compound of the formula



(I)

wherein

X represents a sulphur atom (—S—) or oxygen atom (—O—) in the α or β-configuration;

X^1 represents a C_{1-5} straight chain or branched alkylene group or C_{3-5} straight chain or branched alkenylene group;

Z represents a hydrogen atom or a C_{1-4} straight chain or branched alkyl group;

Y represents a group of formula $—CR_2—CH_2—$ in which each R is independently selected from hydrogen and methyl;

Y^1 represents a methylene group substituted by hydroxyl, a methylene group substituted by hydroxyl and C_{1-6} alkyl, a methylene group or a carbonyl group; and

Y^2 represents a C_{1-7} straight chain or branched alkyl group, phenyl, benzyl or a C_{4-7} cycloalkyl;

X^2 represents a carboxyl, carboxamide, hydroxymethylene, C_{1-6} alkoxycarbonyl or 5-tetrazolyl group; or a salt of said compound of formula (I)

when either X^2 is carboxyl, or

Z is hydrogen or when

X^2 is carboxyl and Z is hydrogen.

9. A method for the treatment or prophylaxis of a thromboembolic disorder in a mammal which comprises administering to the said mammal a compound of claim 1 or a pharmaceutically acceptable salt thereof in an effective amount to treat or prevent said disorder.

4,432,989

αARYL-1H-IMIDAZOLE-1-ETHANOLS

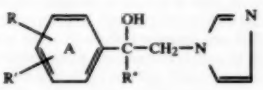
Homer K. Spencer, Randolph, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 170,982, Jul. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 93,800, Nov. 13, 1979, abandoned. This application Apr. 27, 1982, Ser. No. 372,296

Int. Cl.³ C07D *233/64;* A61K *31/415*

U.S. Cl. 424—273 R 13 Claims

1. A compound of the formula:



I

wherein

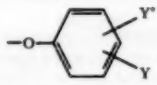
R^* is cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion of 1 to 3 carbon atoms, said cycloalkyl and

cycloalkylalkyl being optionally ring substituted by one or two alkyl groups of 1 to 3 carbon atoms, and

R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms or nitro, and

R' is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, $-CF_3$ in the 3-position of Ring A, nitro, —CN, —COOR", an optionally substituted phenyl group of the formula:

or an optionally substituted phenoxy group in the 4-position of Ring A and having the formula:



R" is hydrogen, alkyl of 1 to 4 carbon atoms or cation, or

R and R' together represent alkylenedioxy of 1 or 2 carbon atoms substituted onto adjacent carbon atoms of the phenyl Ring A, and

Y° and Y are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms.

4,432,990
5-AMINOIMIDAZOLES AS IMMUNOREGULANTS

David Robinson, Shepshed, England, assignor to Fisons plc, Ipswich, England

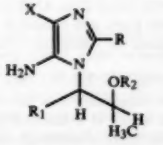
Filed May 11, 1982, Ser. No. 377,125

Claims priority, application United Kingdom, May 15, 1981, 8114895

Int. Cl.³ A61K *31/415;* **C07D** *233/88, 233/90*

U.S. Cl. 424—273 R **9 Claims**

1. A compound of formula I,



I

in which X is —CN, $-CONH_2$, $-CSNH_2$,

or $-CO_2R_3$,

R is H or alkyl C 1 to 8,

R_1 and R_3, which may be the same or different, are each alkyl C 1 to 8, and

R_2 is H or alkanoyl C 2 to 8,

or a pharmaceutically acceptable acid addition salt thereof.

9. A method of treatment of a condition of the immunoregulatory system involving an auto-allergic component, which comprises administration of an effective amount of a compound according to claim 1 to a patient suffering from such a condition.

4,432,991
THERAPEUTICALLY ACTIVE 3-AMINO-1-PHENYL(AND SUBSTITUTED PHENYL)-2-PYRAZOLINES

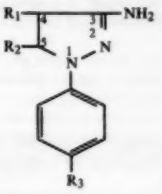
John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 282,905, Jul. 13, 1981, Pat. No. 4,360,680. This application Nov. 1, 1982, Ser. No. 438,080

Int. Cl.³ A61K *31/455;* **A01N** *43/50*

U.S. Cl. 424—273 P **6 Claims**

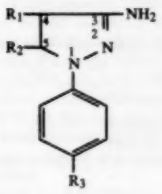
1. A method of meliorating inflammation in a mammal which comprises administering to said mammal an effective anti-inflammatory amount of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is hydrogen, lower alkyl (C_1–C_4), phenyl or

where R_4 and R_5 are the same or different and are hydrogen, halogen, or lower alkyl (C_1–C_4); R_3 is hydrogen, lower alkyl (C_1–C_4), carboxy, methoxy, trifluoromethylcarbonyl or phenyl, with the proviso that when R_3 is hydrogen or lower alkyl (C_1–C_4), then R_2 must be disubstituted phenyl; and the pharmacologically acceptable acid-addition salts thereof.

5. A method of treating bacterial and/or fungal infections in a mammal which comprises administering to said mammal an effective antibacterial and/or antifungal amount of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is hydrogen, lower alkyl (C_1–C_4), phenyl or

where R_4 and R_5 are the same or different and are hydrogen, halogen, or lower alkyl (C_1–C_4); R_3 is hydrogen, lower alkyl (C_1–C_4), carboxy, methoxy, trifluoromethylcarbonyl or phenyl; and the pharmacologically acceptable acid-addition salts thereof.

4,432,992

4-[5(AND 4)-SUBSTITUTED-2-THIENYL]-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

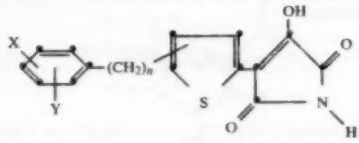
Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 5, 1979, Ser. No. 91,448

Int. Cl.³ A61K *431/38*; C07D *409/04*

U.S. Cl. 424—274 **9 Claims**

1. The compounds of the formula:



wherein

n is 0 to 2;

X and Y are independently hydrogen, halogen, loweralkyl containing 1 to 4 carbons, or a pharmaceutically acceptable salt thereof.

9. A method of treating persons afflicted with calcium oxalate kidney or bladder stones, or preventing the formation of kidney or bladder stones, which comprises administering to such a patient an effective amount of 4-[5-(4-chlorophenyl)-2-thienyl]-3 -hydroxy-3-pyrroline-2,5-dione.

4,432,993

METHOD OF TREATING OBESITY HYPERGLYCEMIA, INFLAMMATION AND PLATELET AGGREGATION

Michael J. Ferris, Sutton, England, assignor to Beecham Group Limited, England

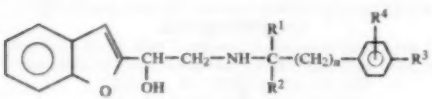
Filed Sep. 24, 1981, Ser. No. 305,117

Claims priority, application United Kingdom, Sep. 26, 1980, 8031228

Int. Cl.³ A61K *31/34*

U.S. Cl. 424—285 **4 Claims**

1. A method for treating obesity in humans or domestic animals comprising administering to an obese human or domestic mammal an effective, non-toxic amount of a compound of formula (I)



(I)

wherein

R^1 is hydrogen or methyl;

R^2 is hydrogen or methyl;

R^3 is hydroxy, hydroxy (C_{1-6}) alkoxy, benzyloxy or a group

X—Y—Z

wherein

(i) X is a bond, Y is C_{1-6} straight or branched alkylene or C_{2-6} straight or branched alkenylene, and Z is hydrogen or carboxy or $—COR^5$ in which R^5 is C_{1-6} straight or branched alkoxy or $—NR^6R^7$ in which R^6 and R^7 are the same or different and each is selected from hydrogen and C_{1-6} straight or branched alkyl; or

(ii) X is oxygen, Y is C_{1-6} straight or branched alkylene and Z is carboxy or $—COR^5$ in which R^5 is C_{1-6} straight or branched alkoxy or $—NR^6R^7$ in which R^6 and R^7 are the same or different and each is selected from hydrogen and C_{1-6} straight or branched alkyl; or

(iii) X is $—O—CH_2—$, Y is C_{2-6} straight or branched alkenylene and Z is carboxy or $—COR^5$, R^5 is C_{1-6} straight or branched alkoxy or $—NR^6R^7$ and R^6 and R^7 are the same or different and each is selected from hydrogen and C_{1-6} straight or branched alkyl,

R^4 is selected from hydrogen, hydroxy, halogen, C_{1-6} straight or branched alkyl or C_{1-6} straight or branched alkoxy; and n is 1, 2 or 3 or a pharmaceutically acceptable salt thereof.

4,432,994

PESTICIDE COMPOUNDS, COMPOSITIONS AND METHODS

David P. Giles, Loughborough; John C. Kerry, Edwalton; Antonin Kozlik, Clifton; Bryan H. Palmer, Burton Joyce; Stephen W. Shutler, Hucknall, and Robert J. Willis, Carlton, all of England, assignors to The Boots Company, Nottingham, England

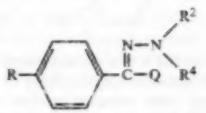
Division of Ser. No. 181,278, Aug. 25, 1980, Pat. No. 4,331,680. This application Feb. 10, 1982, Ser. No. 347,591

Claims priority, application United Kingdom, Aug. 31, 1979, 7930356

Int. Cl.³ A01N *47/12*; C07C *125/065*

U.S. Cl. 424—300 **7 Claims**

1. Compounds of formula I



I

in which Q is p-halophenyl or p-trifluoromethylphenyl and R is $(C_nH_pF_qX_r)O$ where X is chlorine and n is 1 to 3, p is at least 1, q is at least 1, r is 0 to $2n-1$, $p+q+r=2n+1$ and and R^4 is hydrogen and R^2 is an ester group of formula R^8XCO, where X is oxygen or sulphur, and R^8 is alkyl (optionally substituted by C_{1-4} alkoxy; C_{3-7} cycloalkyl; halogen; cyano; phenyl; naphthyl or phenoxy); cycloalkyl; alkenyl (optionally substituted by phenyl); alkynyl; 2-naphthyl; furyl; thienyl; pyridyl; morpholinyl; piperidyl or thiamorpholinyl.

5. A method of combating pests such as insects or acarids which comprise applying a compound according to claim **1** to the locus of the pest.

4,432,995

5-[2-ETHYLAMINO)-1-HYDROXYLETHYL] ANTHRANILONITRILE AND THE USE THEREOF IN MEAT PRODUCING ANIMALS

Jane A. Kiernan, Kendall Park, and Pamela K. Baker, Hopewell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

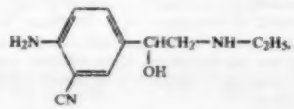
Continuation-in-part of Ser. No. 219,055, Dec. 22, 1980, Pat. No. 4,407,819, which is a continuation of Ser. No. 181,255, Aug. 25, 1980 abandoned, which is a continuation-in-part of Ser. No. 143,070, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,909, Aug. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 219,054, Dec. 22, 1980, Pat. No. 4,404,222, which is a continuation-in-part of Ser. No. 143,069, Apr. 24, 1980, abandoned which is a continuation-in-part of Ser. No. 66,908 Aug. 16, 1979, abandoned. This application Apr. 5, 1982, Ser. No. 365,138

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ A61K *31/275*; C07C *121/50, 121/60, 121/74*

U.S. Cl. 424—304 **6 Claims**

1. 5-[2-(ethylamino)-1-hydroxyethyl] anthranilonitrile of the formula



optically active isomers, or non-toxic, pharmacologically acceptable acid addition salts thereof.

2. A method for increasing lean meat deposition, improving the lean meat to fat ratio, increasing the growth rate and improving the efficiency of feed utilization in warm-blooded animals which comprises orally or parenterally administering to the animals an effective amount of the compound 5-[2-(ethylamino)-1-hydroxyethyl] anthranilonitrile, optically active isomers or non-toxic pharmacologically acceptable acid addition salts thereof.

4,432,996

HYPOCHOLESTEROLEMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION

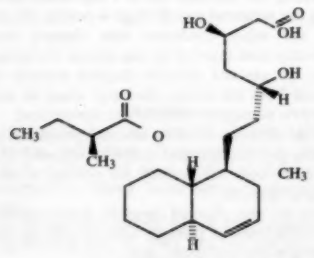
Vincent P. Gullo; Tony Y. K. Lam, both of Edison, and Richard L. Monaghan, Somerset, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 207,508, Nov. 17, 1980, Pat. No. 4,343,814. This application May 17, 1982, Ser. No. 378,934

Int. Cl.³ C07C *69/28, 69/76;* A61K *31/22*

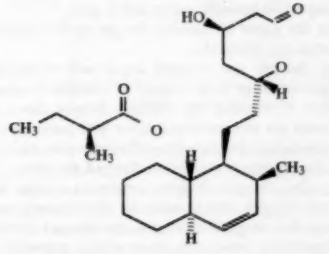
U.S. Cl. 424—311 12 Claims

1. The compound:



or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylamino.

7. An antihypercholesterolemic pharmaceutical composition comprising a pharmaceutical carrier and an effective antihypercholesterolemic amount of the compound:



II

or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylamino.

4,432,997

PROCESS FOR PRODUCING AROMA-CONTAINING FOOD PRODUCTS

Ernst H. Reimerdes, Kiel, Fed. Rep. of Germany, assignor to Dr. Otto Suwelack NACHF. GmbH & Co., Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 350,041

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106250

Int. Cl.³ A23C *9/12, 21/02;* A23L *1/22*

U.S. Cl. 426—7 11 Claims

1. A process for producing aroma-containing food products comprising

(a) separating exogenously or endogenously formed enzyme complexes from cultures of microorganisms suitable for developing specific aromatizing and flavoring agents,

(b) adding the separated enzyme complexes to an aqueous solution or suspension of a substrate whose composition corresponds to that of the basic food stuff to be aromatized,

(c) permitting the resultant mixture to undergo biochemical high speed ripening under conditions suitable for the formation of aromatizing and flavoring agents,

(d) terminating the biochemical high speed ripening by extensive inactivation of the enzyme complexes after the desired aromatizing and flavoring agent concentration has been reached, and

(e) adding the ferment solution or suspension containing the desired aromatizing and flavoring agents to a food substance to be aromatized in sufficient quantity to bring about aromatization.

4,432,998

PREPARATION OF BACTERIA CULTURES TOLERANT TO METAL IONS

Herbert R. Peer, Storm Lake, Iowa, assignor to Transagra Corporation, Storm Lake, Iowa

Continuation-in-part of Ser. No. 873,156, Jan. 27, 1978, Pat. No. 4,349,569. This application Sep. 3, 1982, Ser. No. 414,817

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ A23C *9/12;* C12N *1/36, 1/20;* C12R *1/23*

U.S. Cl. 426—43 9 Claims

1. The improved process of producing non-clumping organisms of the class including Lactobacillus and Streptococcus cultured in the presence of cobalt carbonate to develop characteristics which enhance plant and animal growth when administered in small quantities, comprising the steps of,

selecting a strain of said organisms that when cultured in the presence of said cobalt carbonate will become active in the enhancement of living animal and plant growth but which when subjected to the cobalt carbonate in culture in a nutrient medium develops the characteristic of clumping and a limitation on the percentage of acidity tolerated,

sub-culturing said strain through a series of as many culture steps each in a fresh medium containing the cobalt carbonate and ammonium lactate as required to develop a non-clumping organism,

producing a product by fermentation of the non-clumping organism in the presence of the cobalt carbonate and nutrients with an acidity higher than said limitation thereby increasing the production efficiency.

4,432,999

WHEY-SOYBEAN PRODUCT AND PROCESS FOR MAKING THE PRODUCT

Robert R. Bily, P.O. Box 3637, San Jose, Calif. 95156

Continuation-in-part of Ser. No. 300,699, Sep. 10, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,063

Int. Cl.³ A23C *21/06, 21/08;* A23L *1/20*

U.S. Cl. 426—583 10 Claims

1. The process of preparing a high protein whey-soybean product comprising cooking previously uncooked dry soy-

beans until they are cooked to a firm texture, comminuting the cooked soybeans in finely ground form in the presence of sufficient water to form a soy paste without evidence of free water in which constituents of the cooked soybeans released upon comminution of the cooked soybeans are uniformly dispersed in comminuted form in the soy paste, mixing said soy paste with sufficient whey solids to inter-react the whey constituents with the released constituents in the soy paste and form a paste without evidence of free water of the intermixed and inter-reacted constituents of the soy paste and the whey solids.

4,433,000

METHOD FOR PREVENTING SEPARATION IN FRUIT JUICE-CONTAINING PRODUCTS

Joe R. De Leon, and Maritza G. Boak, both of Houston, Tex., assignors to Coca Cola Company, Atlanta, Ga.

Continuation of Ser. No. 208,311, Nov. 19, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,243

Int. Cl.³ A23L *2/02*

U.S. Cl. 426—599 **11 Claims**

1. A method for reducing separation of solids in a fruit juice-containing product comprising incorporating in said product from about 0.015 to about 0.20% of low viscosity propylene glycol alginate and from about 0.01 to about 0.10% of sodium carboxymethylcellulose, the percents being by weight of total single-strength product; the viscosity of the low viscosity propylene glycol alginate being from about 50 to 175 centipoise for a 2% w/w aqueous solution thereof and the viscosity of the sodium carboxymethylcellulose being from about 25 centipoise for 2% solids w/w aqueous solutions thereof to about 2500 centipoise for 1% solids w/w aqueous solutions thereof.

4,433,001

METHOD FOR PREPARING SCRAMBLED EGGS

Ralph E. Weimer, Lombard; Thaddeus J. Kalowski, Lisle, and Robert A. Novy, LaGrange Park, all of Ill., assignors to Restaurant Technology, Inc., Ill.

Filed Mar. 8, 1982, Ser. No. 355,687

Int. Cl.³ A23L *1/32*

U.S. Cl. 426—614 **9 Claims**

1. A method of preparing scrambled eggs comprising the steps of

disposing liquid eggs to be scrambled within each of at least two egg rings, each egg ring having a lower edge portion in intimate contact with a heated grill surface,

rapidly moving the egg rings to and fro while maintaining said lower edge portions in said intimate contact with said grill surface, thereby to mix and rapidly move the eggs within the confines of said egg rings, and

continuing said rapid movement until the eggs in each egg ring have congealed into a mass of cooked scrambled egg.

4,433,002

PROCESS FOR RAISIN PRODUCTION

Karl T. Zilch, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 133,942, Mar. 25, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 287,398

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—640 **7 Claims**

1. A method for increasing the drying rate of grapes for the production of raisins which comprises contacting the grapes for an effective period of time, but one which is insufficient to be detrimental to the raisin quality, with an aqueous solution maintained at a temperature from 60° C. to 98° C. containing 0.5 to 4 weight percent potassium carbonate and 0.5 to 5 weight percent of a lower alkyl ester of a C_{8-22} fatty acid, said ester containing free fatty acid in an amount up to 10 percent by weight, and thereafter drying the grapes to the desired moisture content.

4,433,003

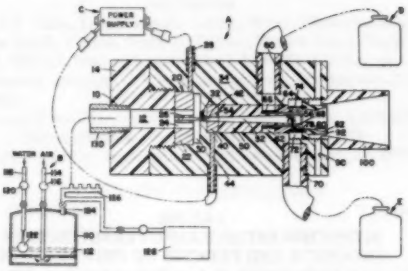
ELECTROGASDYNAMIC COATING SYSTEM

Meredith C. Gourdine, East Orange, N.J., assignor to Energy Innovations, Inc., East Orange, N.J.

Filed Oct. 13, 1981, Ser. No. 310,534

Int. Cl.³ B05D *1/06*

U.S. Cl. 427—27 **28 Claims**



1. A method of electrogasdynamic spraying comprising:

pressurizing a gas saturated with a condensable vapor;

accelerating the saturated gas to a supersonic speed;

passing the saturated gas through a corona discharge such that the vapor condenses into charged droplets on moleculor ions injected by the corona discharge;

passing the gas and charged droplets linearly and unrestricted from the corona discharge along an unrestricted dielectric passage directly to the atmosphere;

aspirating particles of a first material peripherally into the passing gas and charged droplets, whereby the particle aspiration does not restrict the passing of the gas and charged droplets;

spraying the gas, charged droplets, and peripherally aspirated first material particles directly into the atmosphere forming a charged cloud; and,

coating the first material particles with charged droplets, electrostatic repulsion and a decrease in pressure from the dielectric passage to the atmosphere causing turbulence which intermixes the peripherally aspirated first material particles with the charged droplets, whereby even non-ionizable particles become coated with charge and assume a charged state.

19. A method of spraying comprising:

entraining a condensable vapor into a gas;

charging the vapor by causing the gas to flow past corona and attractor electrodes;

spraying the gas and charged vapor and condensing the charged vapor to form a cloud of charged droplets;

subsequent to forming the charged droplet cloud, mixing additional gas and entrained vapor with particles of a first material and condensing the additional vapor such that the particles become coated with charged droplets;

spraying the charged droplet covered particles into the charged droplet cloud, whereby electrostatic repulsion between the charged cloud and the charged droplet covered particles raises the electrostatic potential of the charged particles; and,

receiving the charged droplet covered particles on a grounded surface to dissipate the charge of the droplet covered particles and collect the coated particles.

4,433,004

SEMICONDUCTOR DEVICE AND A METHOD FOR MANUFACTURING THE SAME

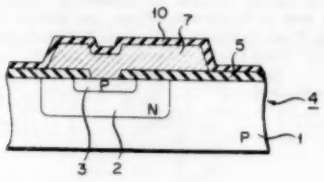
Toshio Yonezawa, Yokosuka, and Masaharu Aoyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 7, 1980, Ser. No. 166,182

Claims priority, application Japan, Jul. 11, 1979, 54-87717; Jul. 11, 1979, 54-87718

Int. Cl.³ H01L *21/283, 21/314*

U.S. Cl. 427—38 11 Claims



1. A method for manufacturing a semiconductor device comprising the steps of forming a metal wiring layer comprising an Al alloy on the surface of a semiconductor substrate, and forming an alumina layer sufficiently thick for blocking water and Na containing at least one metal selected from the group consisting of Cu, Mg, Ni, Cr, Mn, Ti and Y on the surface of said metal wiring layer.

4,433,005

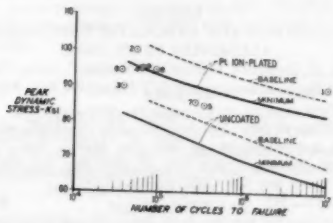
FATIGUE RESISTANT TATANIUM ALLOY ARTICLES

Brian A. Manty, Lake Park; Thomas A. Eckler, West Palm Beach, both of Fla., and Shiro Fujishiro, Yellow Springs, Ohio, assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 143,963, May 5, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,217

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 1 Claim



1. A method for increasing the elevated temperature fatigue strength of titanium articles which consists of using ion implantation to implant materials selected from the group consisting of the noble metals and titanium and mixtures thereof into the surface of the article under the following conditions:

an incident ion energy between about 50 and about 200 kev with the total number of implanted ions exceeding about 10^{15} ions/sq. cm. of article surface but not exceeding about 10^{18} ions/sq. cm.

4,433,006

PROCESS FOR OXIDIZING SEMICONDUCTING COMPOUNDS, ESPECIALLY GALLIUM ARSENIDE

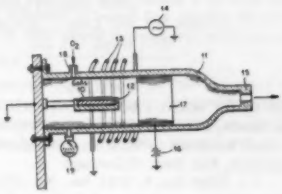
Antonio Cetronio, Rome, Italy, assignor to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed May 28, 1982, Ser. No. 383,179

Claims priority, application Italy, May 29, 1981, 48581 A/81

Int. Cl.³ B05D *3/06, 3/14, 5/12*

U.S. Cl. 427—39 5 Claims



1. A process for providing a substrate of a semiconductive compound with an oxide layer,

comprising the steps of placing said substrate in an atmosphere of highly ionized oxidizing gas, applying an anodic bias to said substrate, and heating said substrate to an elevated temperature significantly reducing the electrical resistivity of said compound.

4,433,007

PROCESS FOR COATING SUBSTRATES WITH AQUEOUS EMULSIONS CONTAINING ORGANOPOLYSILOXANES

Heinrich Marwitz; Kurt Ullrich, and Karl Huhn, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,880

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105148

Int. Cl.³ B05D *3/14, 3/02*

U.S. Cl. 427—54.1 15 Claims

1. A process for coating a substrate which comprises (A) coating the substrate with an aqueous emulsion containing:

(1) A diorganopolysiloxane having terminal SiC-bonded vinyl groups and an average viscosity of from 1000 to 100,000 mPa.s at 25° C.,

(2) An organopolysiloxane having at least three Si-bonded hydrogen atoms per molecule,

(3) A catalyst which promotes the addition of Si-bonded hydrogen to an aliphatic multiple bond,

(6) A vinyl-containing trimethylsiloxy end-blocked diorganopolysiloxane which is present in an amount of from 3 to 30 parts by weight for each 60 to 90 parts by weight of diorganopolysiloxane (1), in which from 10 to 50 percent of the number of the organic radicals bonded to the Si atoms of the diorganopolysiloxane units are vinyl groups and the remaining organic radicals are free of aliphatic multiple bonds,

(7) An organosilicon adhesive compound, and

(8) At least one aqueous dispersion of a polymer selected from the group consisting of ethylene, vinyl acetate, acrylic acid esters, and copolymers thereof containing at least two of these monomers and thereafter (B) crosslinking the coated substrate.

8. The process of claim 1, wherein the coated substrate is crosslinked with ultraviolet light.

4,433,008

DOPED-OXIDE DIFFUSION OF PHOSPHORUS USING BOROPHOSPHOSILICATE GLASS

George L. Schnable, Lansdale, Pa., and Edward A. James, Pennington, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 11, 1982, Ser. No. 377,197

Int. Cl.³ B05D 5/12

U.S. Cl. 427—85 5 Claims

1. A method of diffusing phosphorus into a silicon substrate, said method comprising:

depositing directly on a surface of the substrate a layer of a borophosphosilicate glass; and heating the substrate and the layer to a temperature whereby phosphorus diffuses into the silicon and boron is retained in the glass, said temperature being below about 1000° C.

4,433,009

METHOD OF MANUFACTURING PRINTED CIRCUITS

Helmut Henze, and Ronald Capell, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,181

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021896

Int. Cl.³ B05D 5/12, 3/04; B44C 1/22; C03C 15/00

U.S. Cl. 427—97 15 Claims

1. A method of manufacturing printed circuits, comprising the steps of successively providing a base material having two sides and provided with an adhesive agent; forming a plurality of holes in the base material, in correspondence with a required conductors pattern, so as to subsequently provide for metal contact between conductive trains applied on both sides of a plate; coating the base material provided with the holes, by a photopolymer layer; selectively exposing and developing the photopolymer layer on the base material so as to release zones and boreholes for forming conductive paths, solder eyes and connecting contacts between both sides of the plate; selectively roughening the adhesive agent on the base material in the thus released zones; and applying a current-conductive layer in the regions of the thus released and roughened zones and boreholes so as to form the conductive paths, solder eyes and connecting contacts.

4,433,010

PROCESS FOR PREPARING GLASS CONSTRUCTIONS

Josef Pedain; Wolfgang Wellner, both of Cologne; Klus König, and Hermann Gruber, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,520

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200430

Int. Cl.³ C03C 17/32

U.S. Cl. 427—160 6 Claims

1. A process for the preparation of glass construction comprising applying, to glass, a composition comprising a polyisocyanate component comprising at least one organic polyisocyanate and a polyol component, in quantities corresponding to an isocyanate index of from 80 to 130, wherein said polyol component comprises at least one dihydroxy polyester carbonate having a molecular weight of from 800 to 3000 which constitutes a reaction product of a hexanediol-(1,6) with ϵ-caprolactone, ϵ-hydroxycaproic acid, or a combination of these materials, in a molar ratio of hexanediol-(1,6) to ϵ-caprolactone, ϵ-hydroxycaproic acid, or a combination of these materials in the range of from 4:1 to 1:3, and diarylcarbonates.

4. A process for the preparation of glass constructions comprising applying to glass, a composition comprising an isocyanate prepolymer component which is a prepolymer comprising the reaction of a polyol component with excess quantities of a polyisocyanate component comprising at least one organic polyisocyanate, wherein said polyol component comprises at least one dihydroxy polyester carbonate having a molecular weight of from 800 to 3000 which constitutes a reaction product of a hexanediol-(1,6) with ϵ-caprolactone, ϵ-hydroxycaproic acid, or a combination of these materials, in a molar ratio of hexanediol-(1,6) to ϵ-caprolactone, ϵ-hydroxycaproic acid, or a combination of these materials in the range of from 4:1 to 1:3, and diarylcarbonates.

4,433,011

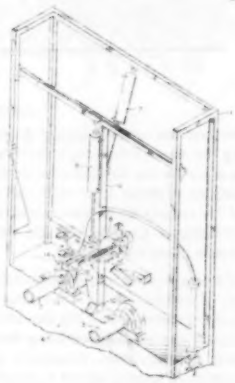
TRACKING NOZZLE FOR VISCOUS FLUID APPLICATION

Douglas A. Larson, Chicago, Ill.; Kenneth L. Tacke; Craig A. White, both of Woodinville, Wash., and Ronald E. Paxton, Seattle, Wash., assignors to Rockcor, Inc., Redmond, Wash.

Filed Dec. 8, 1981, Ser. No. 328,607

Int. Cl.³ B60C 21/08; B29H 13/00

U.S. Cl. 427—231 22 Claims



8. A method for applying a continuous layer of viscous material of predetermined dimensions to the interior of a toroidal body comprising the steps of

positioning a dispenser in the interior of the toroidal body,

providing relative rotation between the body and the dispenser,

dispensing the viscous material onto an interior surface of the body in a width less than the predetermined width of the desired layer,

moving the dispenser relative to the body to produce a layer of the viscous material of said predetermined dimensions.

4,433,012

A PROCESS FOR THE PYROLYTIC DEPOSITION OF ALUMINUM FROM TIBA

Rudolf A. H. Heinecke, Harlow, and Ronald C. Stern, Cheshunt, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 168,845, Jul. 10, 1980, abandoned which is a continuation of Ser. No. 34,067, Apr. 27, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 324,729 Int. Cl.³ C23C 11/00, 13/00

U.S. Cl. 427—252 8 Claims

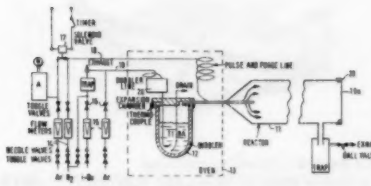
1. A process for the pyrolytic deposition of aluminum from tri-isobutyl aluminum (TIBA) to form an aluminum film on a work piece, comprising the steps of:

a. purging a reaction chamber with nitrogen prior to initiation of said deposition; and

b. terminating the nitrogen purge and pyrolytically depositing aluminum on said workpiece, said depositing step comprising:

(i) passing a stream of dry, oxygen-free inert gas through a quantity of liquid TIBA so as to entrain a portion of TIBA vapor;

(ii) maintaining the liquid TIBA at a temperature between 80° and 90° C.;
(iii) directing the inert gas and entrained TIBA to said reaction chamber in which said workpiece is disposed;
(iv) maintaining a temperature in said reaction chamber within the range between 250° to 270° C. to cause the pyrolytic deposition of aluminum onto a surface of the workpiece; and



(v) supplying periodic pulses of dry, oxygen free inert gas without entrained TIBA to the reaction chamber during deposition whereby a substantially uniform TIBA concentration is maintained within the chamber and spent reactive gases resulting from the decomposition of TIBA are purged from the chamber.

4,433,013

PROCESS FOR IMPARTING HYDROPHOBICITY TO MINERAL SUBSTRATES

Josef A. Pühringer, Stockholm-Täby, Sweden, assignor to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 39,581, May 31, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,098
Int. Cl.³ B05D *3/10*
U.S. Cl. 427—337 **1 Claim**

1. A process for imparting hydrophobicity to an inorganic porous mineral substrate comprising the steps of
applying a composition comprising a dispersion or emulsion formed of a first component selected from the group consisting of a silane, a condensation product of silane, and a hydrolysis product of silane; a second component consisting of 0.01 to 1.0% by volume deactivatable surfactant; and a medium wherein these components are dispersed or emulsified, selected from the group consisting of water and a water-alcohol mixture, to the mineral substrate; and thereafter
deactivating the surfactant by application thereto of liquid or gas containing a deactivating agent selected from the group consisting of alkaline, acid, reducing or oxidizing agents.

4,433,014

PIGMENTED, CORROSION RESISTANT, THERMOSETTING COATING COMPOSITIONS

Joseph E. Gaske, Mt. Prospect, and Hannu K. Pennanen, Elk Grove, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jun. 21, 1982, Ser. No. 390,707
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—380 **14 Claims**

1. A pigmented, corrosion resistant, thermosetting organic solvent solution coating composition comprising, a resinous polyepoxide, a phenoplast resin cross-linking agent for said polyepoxide, a phosphoric acid ester catalyst which is the ester reaction product of ortho phosphoric acid with an aliphatic diol, a chromium-containing pigment providing resistance to corrosion, and a clay having the capacity to fix phosphate.

14. A method of protecting a metal surface subject to corrosion comprising, applying a coating of the coating composition of claim 1, baking the coating to remove solvents and provide a dry film without removing the phosphoric acid contained therein, overcoating the dry film coating with a topcoat, and baking said doubly coated substrate at a temperature and for a time sufficient to cure said first coating.

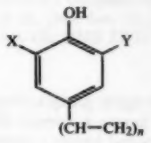
4,433,015

TREATMENT OF METAL WITH DERIVATIVE OF POLY-4-VINYLPHENOL

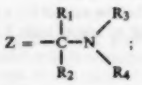
Andreas Lindert, Troy, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Apr. 7, 1982, Ser. No. 366,449
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—388.4 **12 Claims**

1. A stable aqueous composition comprising an effective amount of a water soluble or water dispersible compound selected from the group consisting of a polymer having the following general formula, acid salts thereof and mixtures thereof:



where:
n=from 2 up to a number at which the polymer is not water soluble or water dispersible;
X=H or Z;



Y=H, Z, $CR_5R_6OR_7$, or CH_2Cl;
R_1 through R_7=H, or an alkyl, aryl, hydroxy-alkyl, amino-alkyl, mercapto-alkyl or phospho-alkyl moiety, said R_1 through R_7 being of carbon chain lengths up to a length at which the compound is not water soluble or dispersible;
wherein at least one of X or Y=Z and the Z moieties are present in sufficient amount that the compound is water soluble or water dispersible to form such stable aqueous composition.

4,433,016

MULTIPLE GLAZED UNIT BONDED WITH FIBER-REINFORCED SILICATE CEMENT

James E. Neely, Jr., Lower Burrell, Pa.

Continuation-in-part of Ser. No. 286,993, Jul. 27, 1981, Pat. No. 4,334,941. This application Jun. 14, 1982, Ser. No. 388,330
Int. Cl.³ E06B *3/24*; C09J *1/02*; B32B *13/04*
U.S. Cl. 428—34 **10 Claims**

6. An article of manufacture which comprises:
a. at least two glass sheets in spaced relationship;
b. a cement composition consisting essentially of sodium silicate, potassium silicate, filler and reinforcing fibers; and
wherein said glass sheets are bonded together about the perimeter portion in spaced relationship by said cement composition and an organic sealant about the perimeter portion outside said cement.

4,433,017

THERMALLY REACTIVE WATER-SOLUBLE BLOCKED URETHANE PREPOLYMER

Sumio Goto, Moriyama; Takeshi Doi, Omihachiman, and Kazuo Sato, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

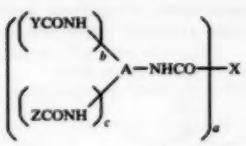
Filed Sep. 14, 1982, Ser. No. 418,121

Claims priority, application Japan, Sep. 17, 1981, 56-148364; Oct. 13, 1981, 56-164850

Int. Cl.³ C08G *18/80*; C08F *8/30*

U.S. Cl. 528—45 12 Claims

1. A thermally reactive, water-soluble and water-stable urethane prepolymer having at least one ionizable group and a plurality of masked isocyanate groups capable of regenerating free isocyanate groups at an elevated temperature, said urethane prepolymer having the formula:



(I)

wherein

A is an organic bridging group having a valence of 3 to 5,

X is the residue having a valence of 2 to 4 of an active hydrogen compound having a corresponding number of reactive hydrogen atoms, after removal of said reactive hydrogen atoms,

Y is a masking group for the masked isocyanate group,

Z is the residue of a compound having at least one reactive hydrogen atom and at least one ionizable group, after removal of said at least one reactive hydrogen atom,

a is the integer 2, 3 or 4, and

b and c are such that the sum of b+c equals 2, 3 or 4 and the products ab and ac are at least 2 and at least 1, respectively.

4,433,018

METHOD OF MANUFACTURING OF TEXTILE FLAT STRUCTURE AND TEXTILE WEB MANUFACTURED THEREBY

Günter Tesch, Fribourg, Switzerland, assignor to Breveteam S.A., Zug, Switzerland

Filed Dec. 10, 1981, Ser. No. 329,300

Claims priority, application Switzerland, Dec. 23, 1980, 9507/80

Int. Cl.³ D04H *11/00*; D05C *17/02*

U.S. Cl. 428—89 31 Claims

17. A textile flat structure with a texture and/or pattern at its upper side, comprising a carrier layer having an upper side and a lower side

a pile yarn tufted in said carrier layer and having pile loops projecting from said upper side of said carrier layer and forming an upper layer, and base loops extending at said lower side of said carrier layer, and wherein some of said pile loops had been engaged by needles and pushed through said carrier layer thereby said upper layer having at least non-uniform different pile heights; and

a lower layer arranged below said carrier layer and composed of a fiber material extending from said lower layer through said carrier layer into said upper layer so that said pile loops of said upper layer are mixed with definite fiber structures extending from said lower layer into said upper layer and anchored in at least one of said lower layer and carrier layer.

4,433,019

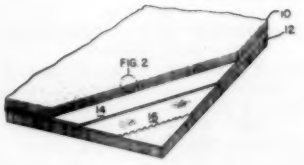
INSULATIVE FABRIC

James F. Chumbley, 16108 Inglewood Rd., Bothell, Wash. 98011

Filed Nov. 8, 1982, Ser. No. 439,748

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—110 9 Claims



1. An insulative fabric, comprising:

(a) a central sheet of breathable, substantially crinkle-free, pliant, aluminized polymeric film having sufficient tensile strength for use as a quilting fabric in quilts, comforters, or clothing; and

(b) spaced layers of hollow, microtubular, filamentous insulation sandwiching the film, each layer being needle-punched through the film

(1) to reduce the overall thickness of the insulation without substantially reducing the insulative capacity of the fabric, and

(2) to provide passageways through the film so that the film is breathable,

wherein the fabric has a soft, fleecy quality; is of a substantially uniform, predetermined thickness; and is substantially noiseless when folded or wrinkled.

4,433,020

SHEET-LIKE MATERIAL, HEAT-INSULATING MATERIAL DERIVED THEREFROM AND METHODS OF MANUFACTURING SAME

Hiroshi Narukawa; Rentaro Tada; Yasuhira Takeuchi, and Osamu Ohara, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 21, 1982, Ser. No. 435,638

Claims priority, application Japan, Oct. 22, 1981, 56-169540; Apr. 14, 1982, 57-62782

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—113 33 Claims

1. A sheet-like material comprising 80 to 97% by weight of a non-inflammable fibrous substance, and 3 to 20% by weight of a binder consisting essentially of a thermoplastic resin, said fibrous substance being orientated at an angle of 3° to 80°, said material having an intermediate layer containing at least 2% by weight of said binder and at least 25% of the average quantity of said binder in said material.

4,433,021

SOUND ATTENUATION SANDWICH PANEL INCLUDING BARRIER MATERIAL FOR CORROSION CONTROL

Frank J. Riel, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sep. 22, 1982, Ser. No. 421,126

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 14 Claims

1. An acoustic honeycomb sandwich panel having structural integrity for use on and around the high speed air and gas flow surfaces of a high-speed aircraft, comprising:

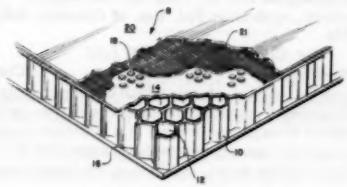
a honeycomb core having a multiplicity of cells disposed transversely to the panel;

a perforated facing sheet of thin sheet metal bonded to one core face;

an imperforate facing of thin sheet metal bonded to the other core face;

a thin layer of open weave non-metallic fabric providing spacing between the strands of the weave of a predetermined size disposed on substantially the entire surface of said perforated sheet remote from said core; and

a thin sheet of microporous metallic fabric constructed of a



metal different from said perforated sheet bonded to and covering substantially the entire surface of said perforated sheet remote from said core with said non-metallic fabric sandwiched therebetween, whereby the non-metallic fabric isolates the adjacent sheets and, the flow through air resistance of the microporous fabric and the perforated facing sheet is not affected by the interposition therebetween of said non-metallic fabric.

4,433,022

THREE-DIMENSIONAL CEILING BOARD FACING

William C. Schwartz, Greensboro, N.C., and Paul B. Blalock, Norwood, N.J., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 104,145, Dec. 17, 1979, Pat. No. 4,320,163. This application Dec. 23, 1981, Ser. No. 333,715

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ B05D *5/00, 3/02;* **B32B** *3/10, 5/20*

U.S. Cl. 428—158 **4 Claims**

3. A decorative ceiling board consisting of a facing fabric laminated to a substrate, said facing fabric including on one surface thereof a uniform cellular layer of foamed and cured material having had printed thereon a foamable, expandable printing paste in a discontinuous predetermined architectural pattern, the foamable printing paste having been expanded and cured.

4,433,023

PANEL FOR ELEVATOR

Kazutoshi Ohta, and Kunio Sakakibara, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 337,507, Jan. 6, 1982, abandoned. This application May 11, 1983, Ser. No. 492,158

Claims priority, application Japan, Jan. 22, 1981, 56-7830[U]

Int. Cl.³ B32B *7/14, 3/28*

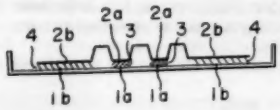
U.S. Cl. 428—182 **5 Claims**

1. A vibrationally damped reinforced structural panel comprising:

a flat front plate having a first surface;

a corrugated reinforcing substrate, the corrugations of said substrate defining at least three aligned second surfaces, said substrate being positioned adjacent said front plate such that said second surfaces face said first surface;

a rigid cured binder bonding only central ones of said second surfaces to said first surface; and



an elastic material bonding only peripheral ones of said surfaces to said first surface, whereby said cured binder provides a fixed bonding between said front plate and substrate while said elastic material provides vibration damping.

4,433,024

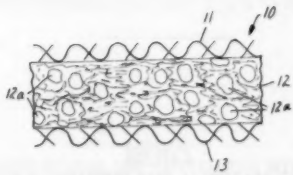
REDUCED-STRESS VAPOR-SORPTIVE GARMENTS

Gilbert L. Elan, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 23, 1982, Ser. No. 401,062

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **38 Claims**



1. Reduced-stress vapor-sorbing garment having as one component sheet material which comprises a permeable support fabric and, attached to the permeable support fabric, a fibrous web which exhibits an insulation value of less than about 0.4 clo and which comprises a coherent mass of melt-blown organic polymeric fibers and vapor-sorptive particles uniformly dispersed in the mass of fibers in an amount of at least 15 grams per square meter area of the sheet material.

4,433,025

HEAT REFLECTING WALL OR CEILING COVERING

Günter Pusch, Bannholzweg 12, 6903 Neckargemund 2; Dieter E. Aisslinger, Heidestr. 54, 6222 Geisenheim; Alexander Hoffmann, Schlostrasse 32, 6909 Rotenberg, and Klaus-Werner Pusch, Bannholzweg 10, 6903 Neckargemund 2, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 137,507, Apr. 4, 1980, Pat. No. 4,340,634, which is a continuation-in-part of Ser. No. 276,791, Jun. 24, 1981. This application Jun. 14, 1982, Ser. No. 388,494

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914476; Jul. 17, 1979, 2928848

Int. Cl.³ B32B *3/10, 3/28*

U.S. Cl. 428—207 **18 Claims**

1. A heat-reflecting covering material for walls and ceilings, having a reflectivity for infrared radiation of more than 60%, comprising a laminate of

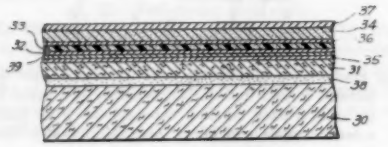
(a) a base substrate material made of wood paper having a weight range of 80 to 300 gms/m^2;

(b) an adhesive lining of a lamination glue 5 to 30 μm in thickness on said base substrate material;

(c) a thin layer of a moisture and alkali resistant paper having a weight range of 40 to 100 gms/m^2 thereon;

(d) a clay coating of 2 to 30 μm thickness;

(e) a base coat of priming layer in a thickness of 1 to 20 μm;
(f) a discontinuous aluminum layer 10 to 1000 nanometers in thickness;
(g) a thin veneer protection layer in a thickness of 0.2 to 10 μm;
(h) a white base cover layer in a thickness of 1 to 20 μm providing the neutral white background;



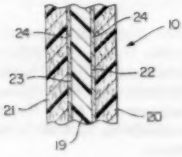
(i) a finishing veneer coating in a thickness of 0.2 to 2 μm and comprising a binder and at least one coloring agent, said veneer being substantially transparent in the wavelength range of 4 to 20 μm; and
(j) a molecular layer of dust and water repellent material in the thickness of 0.05 to 1.0 μm.

4,433,026

CLOTH-LIKE MATERIAL FOR FORMING A SURGICAL GOWN AND/OR A SURGICAL DRAPE AND METHOD OF MAKING THE SAME

Bradley J. Molde, Pleasant Plains, Ohio, assignor to Standard Textile Company, Inc., Cincinnati, Ohio

Filed Oct. 29, 1981, Ser. No. 316,080
Int. Cl.³ B32B 7/00
U.S. Cl. 428—252 **18 Claims**



9. In a cloth-like material for forming a surgical gown and/or a surgical drape, the improvement wherein said material comprises a three-layer flexible laminate having a middle layer of plastic film material and two outer layers of plastic fabric material secured to opposed sides of said middle layer, said middle layer being substantially waterproof and air breathable, one of said outer layers being substantially dimensionally stable, the other of said outer layers being substantially dimensionally unstable so as to generally conform to said one outer layer, said outer layers being secured to said middle layer by adhesive means, said one outer layer comprising a poplin weave of a polyester continuous filament yarn, said other outer layer comprising a tri-cot knit of a polyester continuous filament yarn, said middle layer comprising an expanded polytetrafluoroethylene micro-porous film.

4,433,027

PROCESS FOR FINISHING TEXTILES WITH ALKOXYLATION PRODUCTS, AND COMPOSITIONS FOR THIS

Hans Deiner, Neusäss, and Bernhard Sandner, Diedorf, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 153,389, May 27, 1980, abandoned. This application Dec. 10, 1982, Ser. No. 448,553
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922376
Int. Cl.³ B32B 7/00; B05D 3/02
U.S. Cl. 428—260 **11 Claims**

1. A process for finishing a textile which comprises applying to the textile a diluted composition which contains an emulsified or dissolved alkoxylation product of a hydrogen organopolysiloxane with at least one monovalent unsaturated alcohol having 11 to 18 carbon atoms, and heating the treated textile materials.

4,433,028

METHOD OF TREATING CELLULOSE DI-ACETATE FIBERS

Howard Groelinger, Plainview, N.Y., assignor to M.J.H. Converters, Inc., New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,276
Int. Cl.³ D02G 3/00; B05D 3/02
U.S. Cl. 428—378 **12 Claims**

1. A method of treating cellulose di-acetate fibers to reduce the shrinkage characteristics thereof comprising:

a. immersing said fibers in a treating solution comprising a carrier, an organic thermosetting resin, a nonionic fluorocarbon long chain polymer and an acid liberating catalyst, wherein the fluorocarbon polymer plus the resin comprise between 2 and 25 weight percent of the solution, wherein the ratio by weight of polymer to resin is between 1:1 and 4:1, wherein the fluorocarbon polymer comprises a copolymer of at least 25 weight percent of a fluoroalkyl monomer and an alkylvinyl ether having the formula CH_2=CH—OR wherein R represents a halogen substituted lower alkyl group, and wherein the carrier is selected from the group consisting of water, water plus a water soluble organic solvent, and an organic solvent, wherein the organic solvent is of the type which can be volatized at a temperature below 300° F. without leaving a significant residue and of the type which can be mixed with the fluorocarbon and with the resin without reacting therewith;
b. removing said fibers from said treating solution;
c. drying said fibers with the treating solution thereon at a temperature below 300° F. to drive off substantially all of said carrier therefrom; and
d. curing said fibers with the resin-polymer-catalyst combination thereon at a temperature in excess of 300° F. to polymerize said resin and effect cross-linkage thereof with said fluorocarbon polymer.

11. Acetate fibers treated in accordance with the method of claim **1**.

4,433,029

EXPANDABLE THERMOPLASTIC POLYMER BEADS WITH METHOD OF PRODUCING SAME

Kenichi Senda, Akashi; Tatehiko Nishida, Himeji, and Masao Nakagawa, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 131,047, Mar. 17, 1980, Pat. No. 4,368,218. This application Jul. 2, 1982, Ser. No. 394,683
Claims priority, application Japan, Mar. 19, 1979, 54-32680
Int. Cl.³ C08J 9/16, 9/18
U.S. Cl. 428—407 **11 Claims**

1. Expandable thermoplastic polymer beads comprising a core and a skin substantially surrounding and adhered to said

core, and a foaming agent contained in at least said core, said core consisting of a polymer made from one or more kind of vinyl monomers, said skin comprising a cross-linked olefin polymer produced by polymerizing one or more vinyl monomers in the presence of an olefin polymer and a cross-linking agent, and said foaming agent being gaseous or liquid at ordinary temperature and pressure and having a boiling point lower than the softening point of the core, wherein the weight ratio of said core to said skin is in the range of from 95:5 to 30:70.

4,433,030

PHOTOGRAPHIC SUPPORT

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1982, Ser. No. 372,793
Claims priority, application Japan, May 11, 1981, 56-70378
Int. Cl.³ B32B *27/10*
U.S. Cl. 428—476.9 **7 Claims**

1. A water-proof photographic support comprising a paper sheet coated with a polyolefin on both surfaces thereof, in which the paper sheet contains an alkylketene dimer in an amount of 0.2–3.0% by weight based on the weight of absolutely dried pulp constituting the paper sheet, and a cationic polyacrylamide in an amount of 1/10–10/1 of the weight of the alkylketene dimer.

4,433,031

PRESERVATION OF WOOD

William R. Allen, Sr., Port Murray, N.J., assignor to Cherokee Industries, Inc., Hayward, Wis.

Division of Ser. No. 295,850, Aug. 24, 1981, Pat. No. 4,399,195.
This application May 5, 1983, Ser. No. 491,924
Int. Cl.³ B27K *3/40*; B32B *21/08*; C08K *5/13*
U.S. Cl. 428—541 **19 Claims**

1. A method of treating wood, by causing the deep penetration of the wood by a treating composition, which comprises:

(a) placing the wood to be treated in an evacuation zone and exposing the wood to pressures below atmospheric pressure for a time sufficient to remove moisture and other volatiles from the wood;

(b) immersing the wood in a water based treating composition consisting essentially of an effective amount of a halogenated phenol wood preservative, a sufficient amount of a phenolic resin prepolymer which upon curing will prevent preservative migration, and an amount of a coupling agent sufficient to substantially maintain the preservative and the prepolymer in solution;

(c) maintaining the wood immersed in the treating composition under said reduced pressure until the solution has penetrated into the wood;

(d) increasing the pressure above the liquid to a pressuure above atmospheric to thereby increase the penetration of the wood by said treating agent; and

(e) recovering the treated wood.

11. Treated wood produced by the process of claim 1.

4,433,032

HIGH CHROME WORK ROLL

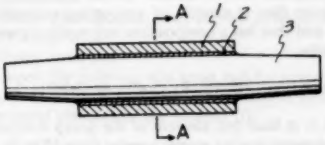
Shiro Nakamura, Ashiya; Yoshihiro Nakagawa, Nishinomiya, and Takashi Hashimoto, Sakai, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Apr. 22, 1981, Ser. No. 256,568
Claims priority, application Japan, Oct. 26, 1979, 54-138461
Int. Cl.³ B32B *15/18*
U.S. Cl. 428—682 **6 Claims**

1. A high chrome work roll comprising an intermediary layer of a cast iron having, on the weight basis, 1.0–2.5% C, 0.5–1.5% Si, 0.5–1.5% Mn and 5–10% Cr, balance substantially Fe being provided between, and united, integrally in the metallurgical sense, with the outer layer of a cast iron having 2.0–3.2% C, 0.5–1.5% Si, 0.5–1.5% Mn, less than 0.08% P, less than 0.06% S, 1.0–2.0% Ni, 10–25% Cr and 0.5–1.5% Mo, balance substantially Fe, and the core having 3.0–3.8% C, 2.3–3.0% Si, 0.3–1.0% Mn, less than 0.1% P, less than 0.02% S, and 0.02–0.1% Mg, balance substantially Fe,

wherein the hardness of the outer layer is 70–80 Hs.

2. A high chrome work roll comprising an intermediary layer of a cast iron having, on the weight basis, 1.0–2.5% C, 0.5–1.5% Si, 0.5–1.5% Mn, less than 1.5% Ni, 5–10% Cr and less than 1.0% Mo, balance substantially Fe being provided



between, and united, integrally in the metallurgical sense, with the outer layer of a cast iron having 2.0–3.2% C, 0.5–1.5% Si, 0.5–1.5% Mn, less than 0.08% P, less than 0.06% S, 1.0–2.0% Ni, 10–25% Cr, 0.5–1.5% Mo less than 1.0% Nb and less than 1.0% V, balance substantially Fe, and the core having 3.0–3.8% C, 2.3–3.0% Si, 0.3–1.0% Mn, less than 0.1% P, less than 0.02% S, less than 2.0% Ni, less than 1.5% Cr, less than 1.0% Mo and 0.02–0.1% Mg, balance substantially Fe,

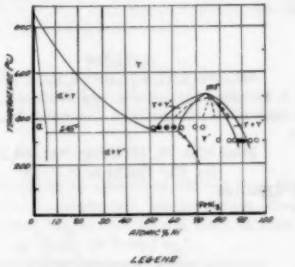
wherein the hardness of the outer layer is 70–80 Hs.

4,433,033

INDUSTRIAL METALS COATED WITH AWARUITE-LIKE SYNTHETIC NICKEL/IRON ALLOYS

John M. Bird, 1187 Ellis Hollow Rd., Ithaca, N.Y. 14850

Filed Aug. 30, 1982, Ser. No. 412,700
Int. Cl.³ C23C *1/00, 5/00, 7/00*
U.S. Cl. 428—682 **25 Claims**



1. A product comprising an industrial metal having a corrosion protective coating of a corrosion resistant synthetic alloy consisting essentially of from about 64 to about 83 atomic % nickel and from about 17 to about 36 atomic % iron, said synthetic alloy having (a) an ordered crystalline structure which is in the single-phase γ' region of the phase diagram of V. T. Heumann and G. Karsten (FIG. 1), and having (b) essentially the properties of the naturally occurring iron-nickel mineral awaruite.

4,433,034
MAGNETIC BUBBLE LAYER OF THULIUM-CONTAINING GARNET

Devlin M. Gualtieri, Ledgewood; Paul F. Tumelty, Morristown, both of N.J., and Mathias A. Gilleo, deceased, late of Morristown, N.J. (by Margaret P. Gilleo, executrix), assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 12, 1982, Ser. No. 367,318
Int. Cl.³ G11C *11/02*; C04B *35/50*
U.S. Cl. 428—693 **5 Claims**

1. A magnetic bubble domain device comprising an iron garnet layer that is capable of supporting magnetic bubble domains and that has a composition nominally represented by the formula:

$$(La, Bi)_a(Sm, Eu)_bTm_cR_{3-a-b-c}(Fe, Al, Ga)_5O_{12}$$

where R is at least one element of the group consisting of Y and the elements having atomic number from 57 to 71, a is from about 0.10 to about 0.18, b is from about 0.50 to about 0.70 and c is from about 0.8 to about 2.22;

a magnet for maintaining in the layer a magnetic field that varies with temperature throughout a temperature range at an average variation rate;

means adjacent to the layer for generating and moving the domains in the layer; and

a gadolinium gallium garnet substrate for supporting the device, whereby a bubble collapse field of the layer varies with temperature throughout the temperature range at about the average variation rate.

4,433,035
CATALYTIC CATHODE COMPOSITION FOR AIR-DEPOLARIZED CELL AND METHOD OF PREPARATION

Marian Wiacek, Mississauga, Canada, assignor to Duracell Inc., Bethel, Conn.

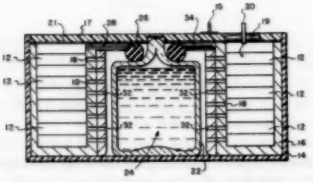
Filed Oct. 26, 1981, Ser. No. 315,320
Int. Cl.³ H01M *4/90*
U.S. Cl. 429—27 **11 Claims**

1. A catalyst mix, for use as a cathode in an air depolarized cell, comprising a carbonaceous material, activated by a metal permanganate admixed with an unactivated carbonaceous material.

4,433,036
MULTICELL RESERVE BATTERY

Robert J. Horning, Doylestown, and William J. Eppley, Skippack, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1982, Ser. No. 364,105
Int. Cl.³ H01M *6/36, 6/38*
U.S. Cl. 429—114 **2 Claims**



1. A reserve battery comprising in combination:

a plurality of galvanic cells;

a casing housing said plurality of cells, said casing including a wall with a plurality of ports formed therein said ports providing an entry through which an electrolyte can flow in order to activate said cells;

a reservoir for electrolyte;

a valve having a plurality of ports formed therein;

means supporting said valve between said wall and said reservoir to permit relative movement there between;

means urging said valve to a position relative to said wall where said wall ports and said valve ports are not aligned when the angular velocity of said battery is constant and permitting angular acceleration of said battery to cause said valve to move relative to said wall so that said valve ports and said wall ports come into alignment during angular acceleration of said battery.

4,433,037
HEAT ERASABLE PHOTOGRAPHIC ELEMENT AND PROCESS COMPRISING SILVER HALIDE

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,483
Int. Cl.³ G03C *11/00, 5/16, 1/00*
U.S. Cl. 430—19 **53 Claims**

1. A heat erasable photographic element comprising a support bearing, in a binder, in reactive association:

(a) photographic silver halide;

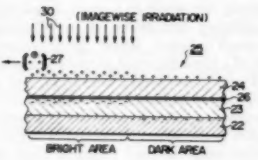
(b) a mild oxidizing agent which consists essentially of a cobalt(III) amine salt which, upon heating said photographic element, will oxidize any latent image silver in the photographic element; and,

(c) a weak complexing agent for the oxidized silver wherein said complexing agent is also a thermal solvent.

4,433,038
ELECTROPHOTOGRAPHIC COPYING PROCESS INVOLVING SIMULTANEOUS CHARGING AND IMAGING

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,327
Claims priority, application Japan, Nov. 12, 1980, 55-158090
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—55 **4 Claims**



1. An electrophotographic copying process for selectively forming a positive or a negative electrostatic latent image utilizing a photosensitive member for electrophotography which includes a conductive layer carrying a sequential lamination of a first and a second photoconductive layer thereon, the first photoconductive layer having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light rays and defined as a first wavelength region, the second photoconductive layer being sensitive only to ultraviolet rays and defined as a second wavelength region, the process comprising a selective use of:

(A) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation in the first wavelength region, followed by a uniform exposure of the photosensitive member to radiation in the second wavelength region to trap a charge in a portion of the photosensitive member corresponding to a dark area of the image to form a positive electrostatic latent image; or

(B) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an

original which is formed by radiation of the first wavelength region, followed by an inverse charging which reduces the entire surface potential to substantially zero, subsequently followed by a uniform exposure of the photosensitive member to radiation in the first wavelength region to trap a charge in a portion of the photosensitive member corresponding to a bright area of the image to form a negative electrostatic latent image.

4,433,039

TRISAZO ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Nobuhiro Miyakawa, Abiko; Teruaki Higashiguti, Tokyo; Yumiko Sano, Ibaragi, and Masatomi Funato, Sakai, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

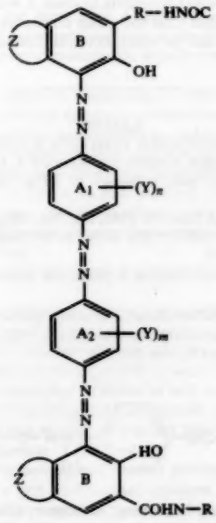
Filed Sep. 21, 1982, Ser. No. 420,875

Claims priority, application Japan, Nov. 2, 1981, 56-174487

Int. Cl.³ G03G 5/06

U.S. Cl. 430—58 **12 Claims**

1. An electrographic photosensitive material which comprises an electrically conductive substrate and a photosensitive layer, wherein the photosensitive layer comprises a charge-generating layer containing a tris-azo pigment, which is formed on said electrically conductive substrate, said tris-azo pigment being a compound represented by the following formula:



wherein Y is a halogen atom, an alkyl group or alkoxy group as a substituent at the ortho-position to the azo group, n is 0, 1 or 2, m is 0, 1 or 2, Z is a benzene ring, naphthalene ring, indole ring, carbazole ring or benzofuran ring fused to the benzene ring B, and R is an unsubstituted or substituted phenyl, naphthyl or benzofuran group; dispersed in an electrically insulating binder,

and a layer of a charge-transporting substance formed on the charge-generating layer.

4,433,040

ELECTROPHOTOGRAPHIC TONER CONTAINING A METAL COMPLEX DYE

Isao Niimura; Hiroshi Imagome; Hiroyoshi Yamaga; Noboru Akuzawa, all of Tokyo; Kenji Yuta, Koriyama, and Takeo Kurahashi, Tokyo, all of Japan, assignors to Hodogaya Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,904

Claims priority, application Japan, Feb. 27, 1981, 56-26768; Jul. 8, 1981, 56-105641

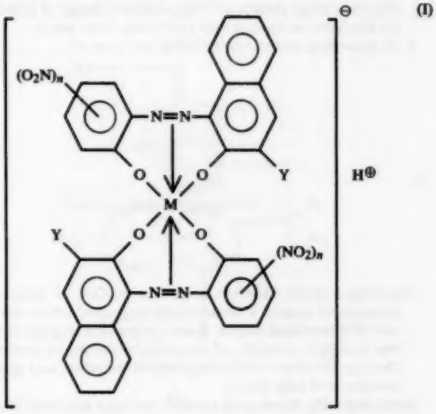
Int. Cl.³ G03G 13/09

U.S. Cl. 430—109 **4 Claims**

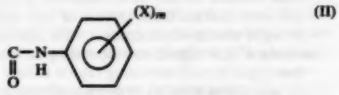
1. An electrophotographic toner capable of being electrified negatively comprising

(a) a binder resin; and

(b) an agent for coloring said toner and for controlling the negative charge of said toner comprising at least one 2:1 type metal complex of the formula (I):



wherein M represents a member selected from the group consisting of chromium and cobalt atoms, n represents an integer of 1 or 2, and Y represents a member selected from radicals of the formula (II):



wherein X represents a member selected from the group consisting of hydrogen and halogen atoms, lower alkyl radicals, lower alkoxy radicals and nitro radicals, and m represents an integer of from 1 to 3.

4,433,041

RECORDING METHOD

Keitaro Yamashita, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 3, 1982, Ser. No. 354,184

Claims priority, application Japan, Mar. 4, 1981, 56-30828; Mar. 4, 1981, 56-30829

Int. Cl.³ G03G 13/14, 13/22

U.S. Cl. 430—122 **12 Claims**

1. A recording method comprising the steps of:

disposing a guide member at least a portion of which is transparent against a nonmagnetic and conductive sleeve of a cylindrical shape which is provided therein with a permanent magnet member having a plurality of magnetic

poles on its surface, thereby forming a recording region between said guide member and said sleeve;

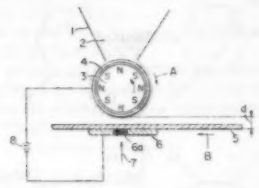
supplying a dry developing powder having a magnetic property on said sleeve;

rotating said permanent magnet member relative to said sleeve to form a magnetic brush at least in said recording region;

passing a recording sheet paper at least a rear surface of which opposing said guide member is transparent along a front surface of said guide member in opposition to said sleeve to make a front surface of said recording sheet paper to be brought near to or in contact with said magnetic brush;

emitting a light signal corresponding to a picture information signal to said recording region at least from a rear side of said guide member, whereby an electric charge pattern positively or negatively corresponding to said picture information signal is formed on the front surface of said recording sheet paper and at the same time said dry developing powder or said magnetic brush is deposited on said electric charge pattern to form a picture image of powder on the front surface of said recording sheet paper.

8. A recording method comprising the steps of:



disposing a guide member at least a portion of which is transparent against a nonmagnetic and conductive sleeve which is provided therein with a permanent magent member having a plurality of magnetic poles on its surface, thereby forming a recording region between said guide member and said sleeve;

supplying a dry developing powder having a magnetic property on said sleeve;

rotating said permanent magnetic member relative to said sleeve to form a magnetic brush at least in said recording region;

passing a recording sheet paper at least a rear surface of which opposing said guide member is transparent along a front surface of said guide member in opposition to said sleeve to make a front surface of said recording sheet be brought near to or in contact with said magnetic brush;

emitting a light signal corresponding to a picture information signal to said recording region at least from a rear side of said guide member to form a picture image of powder on the front surface of said recording sheet, said developing powder is a single component magnetic toner containing a photoconductive substance and the recording sheet is an ordinary paper of a volume resistivity of less than 10^{12} Ω.cm.

4,433,042

ELECTROPHOTOGRAPHIC DEVELOPING METHOD USING MAGNETIC TONERS

Tsuneaki Kawanishi; Akio Mukoh; Hirosada Morishita, and Nobuyoshi Hoshi, all of Hitachi, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,197

Claims priority, application Japan, Dec. 10, 1980, 55-173297

Int. Cl.³ G03G *13/09*

U.S. Cl. 430—126 **6 Claims**

1. A method for electrophotographic developing, the method comprising the steps of electrostatically forming a latent image on an organic photoconductive member, supplying a single component magnetic toner containing at least a resin and find particles of ferromagnetic material on a non-magnetic sleeve provided with a permanent magnetic means having a plurality of magnetic poles therein, the magnetic toner having a resistivity of more than 5×10^{15} Ω.cm and a relative dielectric constant of less than 2.6, transporting the magnetic toner into a gap between the organic photoconductive member and the non-magnetic sleeve, attaching the magnetic toner to the organic photoconductive member, thereby developing the latent image into a visible image, electrostatically transferring the toner image thus formed on the organic photoconductive member onto a transfer sheet of ordinary paper having a low electric resistance with a bulk resistivity of not greater than 10^{12} Ω.cm, and fixing the transferred image, thereby obtaining a final image.

4,433,043

WATER BASED PHOTOSENSITIVE COMPOSITION WITH HYDROLYZATE OF MAMMAL COLLAGEN

Yoshikatu Sawada, Tokyo; Kazuo Shirakawa, Ichikawa, and Takeo Sugiura, Tokorozawa, all of Japan, assignors to Toppan Printing Co., Ltd. and Nippi, Inc., both of Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,048

Claims priority, application Japan, Nov. 18, 1980, 55-162141

Int. Cl.³ G03C *1/60, 1/71*

U.S. Cl. 430—175 **9 Claims**

1. A water based photosensitive composition, comprising a water soluble hydrolyzate of a mammal collagen and a photosensitizer serving to cross-link the hydrolyzate when exposed to an active light, said hydrolyzate having a number-average molecular weight, Mn, of 2,000 to 30,000 and an intrinsic viscosity, [η], of 0.060 to 0.155 dl/g in a 0.15 mole citric acid buffer solution maintained at 40° C., and being capable of maintaining the formability of the collagen fold.

8. The composition according to claim **1**, wherein the photosensitizer is selected from the group consisting of bichromates, diazonium salts and paraformaldehyde condensates of diazonium salts.

4,433,044

DRY DEVELOPABLE POSITIVE PHOTORESISTS

Wolfgang H. Meyer, Urdorf, and Bernard J. Curtis, Gattikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

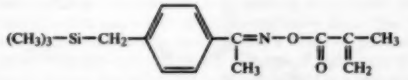
Filed Nov. 15, 1982, Ser. No. 441,682

Int. Cl.³ G03F *7/26;* **G03C** *1/76;* **C08F** *30/08*

U.S. Cl. 430—271 **10 Claims**

1. A method of forming a patterned layer on a substrate comprising:

(a) coating the substrate with a composition comprising the copolymer of a silicon-containing oxime ester of methacrylic acid represented by the formula



and an acrylate-containing monomer selected from the group consisting of acrylic acid, methacrylic acid and their esters, and a suitable solvent therefor;

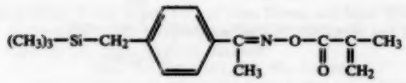
(b) drying the coating to form a resist film;

(c) irradiating selected portions of the film with a source of ultraviolet radiation;

(d) baking the film under vacuum; and

(e) dry developing the film to remove the irradiated portions thereof by etching in an oxygen plasma.

10. A copolymer of a silicon-containing oxime ester of methacrylic acid represented by the formula



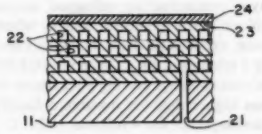
and an acrylate-containing monomer selected from the group consisting of acrylic acid, methacrylic acid and their esters.

4,433,045

LASER MIRROR AND METHOD OF FABRICATION

John G. Gowan, London, England, and Keith R. Shillito, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 342,996
Int. Cl.³ G03C 5/00; G02B 5/08
U.S. Cl. 430—321 **4 Claims**



1. A method for fabricating a fluid cooled laser mirror, including a heat exchanger defining a plurality of fluid conducting passageways therethrough, which comprises the steps of:

a. providing a substrate comprising a carbon member;

b. depositing onto said substrate a transitional layer comprising carbon and tungsten carbide, said transitional layer varying in composition from substantially totally carbon in contact with said substrate to substantially totally tungsten carbide remote from said substrate, said substrate and transitional layer defining a substructure;

c. depositing onto said substructure a first layer of low melting point metal;

d. applying to said first layer a coating of photoresist material;

e. overlaying onto said coating a photographic mask having a predetermined pattern cut therein to define selected masked and unmasked portions of said coating;

f. exposing said unmasked portions of said coating to light to harden said unmasked portions of said coating;

g. chemically removing said unmasked portions of said coating and that portion of said first layer underlying said unmasked portion of said coating;

h. chemically removing said masked portion of said coating to provide a first intermediate structure comprising said substructure having thereon distinct areas of said low melting point metal configured in said predetermined pattern;

i. vapor depositing on said first intermediate structure a tungsten-containing second layer covering said low melting point metal pattern to a predetermined thickness;

j. removing said low melting point metal to provide a second intermediate structure comprising said first intermediate structure with said second layer applied and defining a plurality of passageways therethrough in said predetermined pattern; and

k. applying a mirrored surface to said second layer.

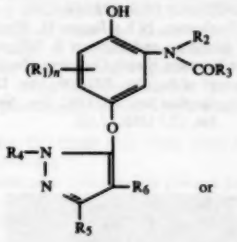
4,433,046

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morito Uemura; Kenichi Kishi; Satoshi Nakagawa, and Shuji Kida, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

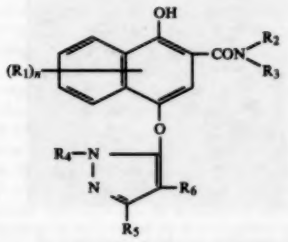
Filed May 28, 1982, Ser. No. 383,318
Claims priority, application Japan, Jun. 3, 1981, 56-86066
Int. Cl.³ G03C 7/16, 7/26
U.S. Cl. 430—385 **6 Claims**

1. A silver halide photographic material comprising a support provided thereon with a light-sensitive silver halide emulsion layer containing as a cyan-dye-forming coupler a compound of the formula



(1)

or



(2)

wherein R_1 is a halogen atom, an alkyl, alkoxy or acylamino group; R_2 and R_3 are respectively a hydrogen atom, an alkyl or aryl group and R_2 and R_3 may form a heterocyclic group by the condensation thereof; n is an integer of 0–3; R_4 is an alkyl, aryl, acyl or heterocyclic group; R_5 is an alkyl, aryl, alkoxy, amino, acylamino, sulfonamide, carboxy, alkoxycarbonyl, carbamoyl, cyano or halogenated alkyl group; and R_6 is a hydrogen atom or an alkyl, alkoxy, carboxy, carbamoyl, hydroxy, acyloxy, nitro, amino, azo, acylamino, sulfonamide or acyl group.

4. A method for producing a cyan dye image by color development of an exposed silver halide photographic material of claim 1.

4,433,047

PHOTOGRAPHIC ELEMENTS CONTAINING DIRECT-POSITIVE EMULSIONS AND PROCESSES FOR THEIR USE

Robert A. Silverman, Rochester, and Harry A. Hoyen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,313
Int. Cl.³ G03C 5/24
U.S. Cl. 430—409 **23 Claims**

1. A photographic element particularly adapted to forming a direct-positive image comprised of

a support and, located on said support,

a first, radiation-sensitive emulsion layer containing core-shell silver halide grain population having a coefficient of variation of less than 20%, and

a second silver halide emulsion layer substantially incapable of forming a surface latent image within the direct-posi-

tive exposure latitude of the first emulsion layer and containing a second grain population capable of internally trapping photolytically generated electrons,

said second grain population having an average diameter less than 70% that of said first grain population, and

said first and second silver halide grain populations being present in a weight ratio of from 5:1 to 1:5.

4,433,048

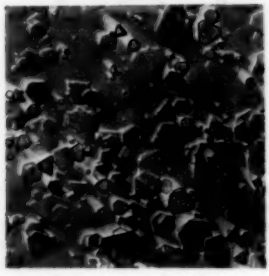
RADIATION-SENSITIVE SILVER BROMOIODIDE EMULSIONS, PHOTOGRAPHIC ELEMENTS, AND PROCESSES FOR THEIR USE

John C. Solberg, Rochester, N.Y.; Roger H. Piggin, Abbots Langley, United Kingdom, and Herbert S. Wilgus, Conesus, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,909, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,913

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—434 **58 Claims**



1. A radiation-sensitive emulsion comprised of:

a dispersing medium and

silver bromoiodide grains, wherein at least 50 percent of the total projected area of said silver bromoiodide grains is provided by tabular silver bromoiodide grains having first and second opposed, substantially parallel major faces, a thickness of less than 0.3 micron, a diameter of at least 0.6 micron, and an average aspect ratio of greater than 8:1,

said tabular silver bromoiodide grains being comprised of, in an amount sufficient to improve the photographic response of said emulsion, tabular silver bromoiodide grains having a central region extending between said major faces, said central region having a lower proportion of iodide than at least one laterally displaced region also extending between said major faces.

4,433,049

METHOD FOR PREPARING A LIGHT-SENSITIVE CUPROUS HALIDE EMULSION

Noboru Itoh; Toshiaki Takahashi; Keiji Ogi, and Atsushi Kamitakahara, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

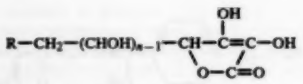
Filed Feb. 10, 1982, Ser. No. 347,647

Claims priority, application Japan, Feb. 21, 1981, 56-24669

Int. Cl.³ G03C *1/72*

U.S. Cl. 430—495 **13 Claims**

1. A method for preparing a light-sensitive cuprous halide emulsion which comprises reducing cupric ions in a liquid phase with an ascorbic acid derivative represented by the formula:



wherein R is a hydrogen atom or a hydroxyl group, and n is an integer of 1 to 4, provided that R is a hydroxyl group when n is 1, or alkali metal salts thereof, in the presence of halogen ions and from 0.1 to 5% by weight of a protective colloid.

4,433,050

DIRECT POSITIVE TYPE LIGHT SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Takao Abe, and Satoru Hohnishi, both of Hino, Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,644

Claims priority, application Japan, Sep. 11, 1980, 55-126859; Sep. 11, 1980, 55-126860

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—542 **39 Claims**

1. A direct positive type light sensitive silver halide photographic material which comprises, on said support,

at least one layer containing an unfogged internal latent image type silver halide emulsion which, when applied onto a test piece, exposed for from 1/100 to 1 second, and developed for 3 minutes at 20° C. in an internal developing solution, produces an image having a maximum density of at least 5 times higher than the maximum density obtainable by the development for 4 minutes at 20° C. in a surface developing solution, said internal developing solution having the following composition

hydroquinone: 15 g

monomethyl-p-aminophenol sulfate: 15 g

sodium sulfite (anhydride): 50 g

potassium bromide: 10 g

sodium hydroxide: 25 g

sodium thiosulfate (crystals): 20 g

water: to bring the solution to one liter,

and said surface developing solution having the following composition

p-hydroxy phenylglycine: 10 g

sodium carbonate (crystals): 100 g

water: to bring the solution to one liter; and

an internal latent image type silver halide emulsion having fog centers in silver halide grains which, when applied onto a test piece, exposed for from 1/100 to 1 second and developed for 3 minutes at 20° C. in said internal developing solution, produces an image having a maximum density of at least 10 times higher than the maximum density obtainable by the development for 4 minutes at 20° C. in said surface developing solution, and has a degree of fogging such that when a sample composed of a transparent support comprising a polyethylene terephthalate film coated with the emulsion having fog centers in an amount of from 3.5 to 4.5 g/m^2 as the amount of silver, and developed in said internal developing solution at 20° C. for 3 minutes, the transmission density will be at least 0.50;

the proportion of the unfogged internal latent image type silver halide emulsion to the internal latent image type silver halide emulsion having fog centers in silver halide grains is from 10:0.03 to 10:30 in a molar ratio based on silver halide;

said internal latent image type silver halide emulsion having fog centers in silver halide grains is incorporated (i) in said layer containing said unfogged internal latent image type silver halide emulsion or (ii) in another layer of said photographic material when said photographic material comprises more than two layers.

4,433,051

DERIVATIVES OF α-DIFLUOROMETHYLORNITHINE USEFUL IN ANALYSIS

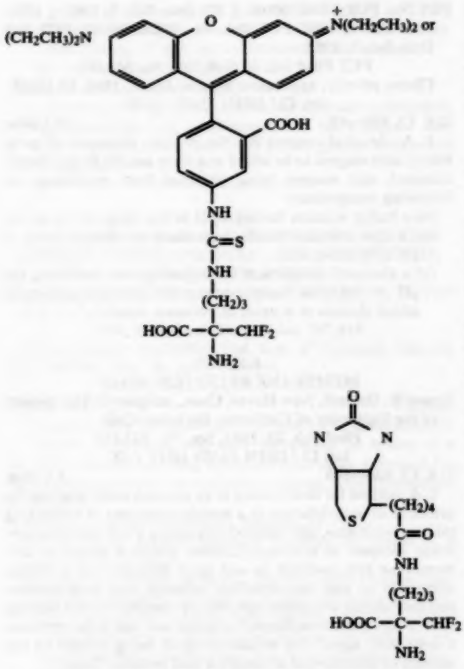
Gad Gilad; Varda Gilad, both of Ness Ziona, and Meir Wilchek, Rehovot, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Iceland

Filed Oct. 14, 1981, Ser. No. 311,981

Int. Cl.³ G01N *33/50*; C12Q *1/00*; C12N *9/99, 9/88*

U.S. Cl. 435—7 4 Claims

1. A labelled derivative of α-difluoromethylornithine (α-dFMO), namely α-dFMO tagged with rhodamine B or with biotin, respectively, of the formulas



4. A process for the cytochemical localization of ornithine decarboxylase (ODC) activity comprising:

subjecting tissue samples to the action of an enzyme activated irreversible inhibitor of ODC which inhibitor has been labelled with specific molecules which render it visible by light or fluorescence microscopy; and

visually localizing the labelled inhibitor by light or fluorescence microscopy,

wherein said enzyme activated irreversible inhibitor of ODC is an α-dFMO derivative in accordance with claim 1.

4,433,052

PROCESS FOR PRODUCING INTERFERON

Masahiko Iizuka, Fujisawa; Hidenobu Kubota, Siga, and Emiko Sano, Yokohama, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,369

Claims priority, application Japan, May 29, 1980, 55-70862

Int. Cl.³ C12P *21/00, 21/02*; C12N *5/00*

U.S. Cl. 435—68 12 Claims

1. A process for producing interferon by treating animal cells proliferated on a positively charged microcarrier which comprises treating said proliferated cells, either before or before and during treatment of the cells with an interferon inducer, with a negatively charged water-soluble macromolecular material selected from the group consisting of carboxymethyl cellulose, polyalginate, polyglutamate, pectin, cellulose phosphate, dextran sulfate, and heparin, maintaining said treated cells under conditions suitable for the production of interferon, and recovering interferon.

4,433,053

FERMENTATION PROCESS FOR THE PRODUCTION OF POLY(β-HYDROXY BUTYRIC ACID)

Lorenzo Hughes, Yarm, and Kenneth R. Richardson, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 10, 1981, Ser. No. 291,762

Claims priority, application United Kingdom, Aug. 19, 1980, 8027004

Int. Cl.³ C12P *7/52, 7/44, 7/42*; C12N *1/38*

U.S. Cl. 435—141 10 Claims

1. A continuous fermentation process for the production of bacterial cells containing poly (β-hydroxy butyric acid), comprising (i) continuously or intermittently supplying to a fermentation vessel containing a poly (β-hydroxy butyric acid)-accumulating micro-organism of the Alcaligenes genus, a micro-organism-free feed containing (a) an aqueous medium containing nutrient salts and (b), as a carbon and energy source, a water soluble compound that is assimilable by the micro-organism and which contains at least carbon and hydrogen, wherein said micro-organism-free feed includes a restricted amount of at least one of the elements selected from the group consisting of assimilable nitrogen, phosphorus, magnesium, sulphur and potassium, which elements are essential to growth of the micro-organism but not to accumulation of poly (β-hydroxy butyric acid), (ii) aerobically cultivating said micro-organism in said vessel so that it grows and accumulates poly (β-hydroxy butyric acid), and (iii) continuously or intermittently removing an equivalent amount of aqueous medium containing bacterial cells from the vessel so as to maintain the amount of aqueous medium in the vessel substantially constant, said restricted amount of elements being such that the bacterial cells removed from said vessel contain at least 25% by weight of poly (β-hydroxy butyric acid).

4,433,054

ENZYMATIC ACTIVE SUBSTANCE IMMOBILIZED IN A POLYSACCHARIDE GEL MATRIX

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto, and Isao Takata, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Nov. 20, 1981, Ser. No. 323,288

Claims priority, application Japan, Jan. 9, 1981, 56-2410

Int. Cl.³ C12N *11/10, 11/12, 11/04*

U.S. Cl. 435—178 8 Claims

1. An immobilized enzymatic active substance which comprises an enzymatic active substance and an unsubstituted amino, monoalkylamino or dialkylamino group-introduced carrageenan wherein said group is present in said carrageenan in an amount such that there is 0.1 to 20 mg of nitrogen present per 1 g of dry weight of said carrageenan and each alkyl is individually 1 to 12 carbon atoms, said enzymatic active substance being entrapped within a gel matrix of said carrageenan.

4,433,055

DECOMPOSING PLANT

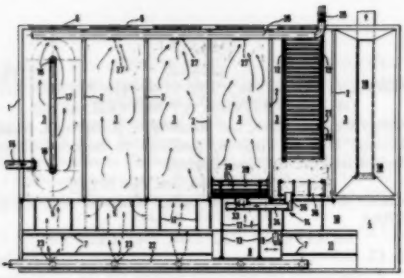
Manfred Kany, Feldstrasse 9, D-6601-kleinblittersdorf 5, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,124

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117451

Int. Cl.³ C12M *1/04*

U.S. Cl. 435—313 26 Claims



1. A decomposing plant for refuse comprising:

(a) decomposing means including a plurality of discrete decomposing compartments for decomposing material in batches, said compartments being disposed at substantially the same level, and each of said compartments being bounded by a sidewall having first sides and second sides, said compartments being disposed with first sides of successive compartments adjacent to one another, and selected ones of said second sides being provided with doors for access to the respective compartments;

(b) inlet means for admitting material to be decomposed into said decomposing means;

(c) outlet means for evacuating material which has undergone decomposition from said decomposing means;

(d) transfer means for transferring a batch of material between successive compartments in a direction from said inlet means towards said outlet means, said transfer means comprising a unit which is movable along and into said compartments, and said unit including means for transporting material over said sidewalls from one compartment to another; and

(e) aerating means for aerating the material in said compartments

---

4,433,056

PROCESS FOR PREPARATION OF CONTROL FOR USE IN ESTROGEN RECEPTOR TEST

Richard J. Baranczuk, 10127 Horton, Overland Park, Kans. 66202

Continuation-in-part of Ser. No. 305,108, Sep. 24, 1981. This application Dec. 21, 1981, Ser. No. 332,609

Int. Cl.³ G01N *33/50, 33/74*

U.S. Cl. 436—8 10 Claims

8. A process for the production of a control sample for use in estrogen receptor assays; said process comprising the steps of:

(a) inducing superovulation in rabbits;

(b) in conjunction with such superovulation inducing pregnancy in the rabbits;

(c) collecting uteri tissue from approximately 6 day pregnant rabbits following steps (a) and (b);

(d) freezing said tissue;

(e) shreading said tissue into relatively small strips;

(f) adding a buffer solution having a pH of approximately 7.5 to said tissue;

(g) homogenizing said buffer and tissue;

(h) centrifuging said homogenized buffer and tissue;

(i) removing the supernatant from said centrifuged buffer and tissue;

(j) freezing said supernatant; and

(k) subjecting said frozen supernatant to a vacuum so as to freeze dry said supernatant into dry flakes.

4,433,057

CHEMICAL REAGENT INDICATOR FOR THE IN VITRO DIAGNOSIS OF PREGNANCY

Maria R. de Gracia, 6 Avenue Dapples, Lausanne (Vaud), Switzerland

PCT No. PCT/FR80/00109, § 371 Date Feb. 5, 1982, § 102(e) Date Feb. 5, 1982, PCT Pub. No. WO82/00060, PCT Pub. Date Jan. 7, 1982

PCT Filed Jul. 3, 1980, Ser. No. 348,067

Claims priority, application France, Jun. 6, 1980, 80 12638

Int. Cl.³ G01N *33/52, 33/76*

U.S. Cl. 436—65 16 Claims

1. A chemical reagent for the in vitro diagnosis of pregnancy, said reagent to be added to a urine sample from a female mammal, said reagent being obtained from combining the following components:

(a) a buffer solution having a pH in the range of 5.2 to 6.6;

(b) a dye colorimetrically responsive to the presence of HCG in urine; and

(c) a chemical component for adjusting and stabilizing the pH of the urine sample when the chemical reagent is added thereto to a value of between 4 and 5.

4,433,058

MEMBRANE RECEPTOR ASSAY

James W. Deutsch, New Haven, Conn., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 23, 1981, Ser. No. 237,210

Int. Cl.³ G01N *33/60;* G01T *1/00*

U.S. Cl. 436—504 5 Claims

1. A method for determining in an aqueous assay medium the presence of acetylcholine in a sample suspected of containing said acetylcholine, said method employing a cell surface membrane receptor to said acetylcholine which is bound to said membrane and insoluble in said assay medium and a labeled antagonist to said acetylcholine, wherein said acetylcholine and said labeled antagonist specifically compete for the binding sites of said membrane-bound receptor and said label provides a detectable signal, the measured signal being related to the amount of label bound to receptor and unbound label;

said method comprising:

combining substantially simultaneously in an aqueous buffered medium said membrane-bound receptor, said sample and said labeled antagonist;

incubating for sufficient time to allow for competition between labeled antagonist and acetylcholine resulting in partitioning of said labeled antagonist between said membrane-bound receptor and said assay medium in proportion to the amount of acetylcholine in said medium; and

determining the level of signal as a result of said partitioning.

4,433,059

DOUBLE ANTIBODY CONJUGATE

Chi-Deu Chang, Bridgewater, and Henry A. Graham, Jr., Annandale, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Sep. 8, 1981, Ser. No. 299,764

Int. Cl.³ G01N *33/54, 33/58, 33/60*

U.S. Cl. 436—512 23 Claims

1. An immunoassay reagent for detecting an antigen comprising:

(a) a first immunoglobulin;

(b) a second immunoglobulin of different specificity than said first immunoglobulin and specific for the antigen to be detected; and

(c) a hetero-bifunctional coupling reagent selectively coupling said first immunoglobulin to at least part of the interchain disulfide linkage of said second immunoglobulin.

15. A method for detecting the presence of a specified antigen within an aqueous sample comprising the steps of:

(i) combining with said sample

(a) an immunoassay reagent for detecting an antigen employing an indicator substance having an associated antigen comprising: a first immunoglobulin specific for said associated antigen, a second immunoglobulin specific for the antigen to be detected, and a hetero-bifunctional coupling reagent selectively coupling said first immunoglobulin to at least part of the interchain disulfide linkage of said second immunoglobulin, and

(b) said indicator substance;

(ii) agitating said combination;

(iii) allowing said agitated combination to settle undisturbed; and observing said combination for the indicator substance whereby the presence of the antigen to be detected is indicated.

4,433,060

CHEMILUMINESCENT IMMUNOASSAYS WITH TRIPHENYLMETHANE DYES ACTIVATED BY H_2O_2 AND A CHLORAMINE

Bernd Frenzel, Spitzelbergstrasse 18a, 8000 München 71, Fed. Rep. of Germany

Filed May 26, 1981, Ser. No. 267,414

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048447; Feb. 20, 1981, 3106444

Int. Cl.³ G01N *33/54, 33/58, 33/52*

U.S. Cl. 436—518 **7 Claims**

1. A process for the quantitative or qualitative determination of antigens, antibodies, and their complexes by means of a chemiluminescing labelling substance excited or activated for chemiluminescence by an analytical reagent, which comprises the steps of:

(a) forming a chemiluminescing complex by

(i) forming an antigen/antibody complex by means of a serological reaction;

treating said antigen/antibody complex with a chemiluminescing conjugate containing a chemiluminescing labelling substance in the form of a chemiluminescing triphenylmethane dye coupled to an antigen, antibody or antigen/antibody complex to give said chemiluminescing complex; or

(ii) directly forming said chemiluminescing complex by means of a serological reaction between said chemiluminescing conjugate and an antigen or antibody;

(b) separating said chemiluminescing complex;

(c) adding an exciting analytical reagent selected from mixtures of H_2O_2 with a chloramine; and

(d) measuring the chemiluminescence resulting from step (c).

4,433,061

RADIOIMMUNOASSAY FOR CYCLIC NUCLEOTIDES

Chih-Sheng Chiang, Chatsworth, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 1, 1981, Ser. No. 269,155

Int. Cl.³ G01N *33/56, 33/58, 33/60*

U.S. Cl. 436—542 **16 Claims**

1. In a process for the determination of a cyclic nucleotide in a cyclic nucleotide containing body fluid by radioimmunoassay comprising the steps of admixing the body fluid, an antibody for the cyclic nucleotide, and a tracer; permitting reaction to occur for binding the tracer; separating bound tracer from free tracer; and measuring either the bound or free tracer to quantitatively determine the cyclic nucleotide, the improvement comprising the step of adding a source of divalent cation in an amount sufficient to minimize the interference of endogenous calcium ion while admixing the antibody, tracer and body fluid.

4,433,062

MOLDABLE FLUOROPHOSPHATE GLASSES CONTAINING NB_2O_5

Philippe L. P. Courbin, Bordeaux, and Jean P. Mazeau, Avon, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,354

Claims priority, application France, Jun. 4, 1982, 82 09731

Int. Cl.³ C03C *3/16, 3/18*

U.S. Cl. 501—44 **4 Claims**

1. A glass composition of the fluorophosphate type containing niobium oxide having a softening point no higher than 500° C. and being suitable for direct forming of optical components through molding or pressing exhibiting precision surfaces selected from the group of:

(a) a zinc-free glass composition having a refractive index higher than about 1.57 and an Abbe number higher than about 55 and consisting essentially, in weight percent on the oxide basis as batched, of

P_2O_5	35–46	SrO	0–15
Al_2O_3	3.5–6.5	MgO	0–7
Li_2O	0.8–3.0	BaO + CaO + SrO + MgO	28–47
Na_2O	3–10	CaO + SrO + MgO	<15
$Li_2O + Na_2O$	5–10.5	Nb_2O_5	3–8.5
BaO	18–44	F	4.5–8
CaO	0–12		

and

(b) an aluminum-free glass composition having a refractive index between about 1.68–1.85 and an Abbe number <38 and consisting essentially, in weight percent on the oxide basis as batched, of

P_2O_5	30–35	Sb_2O_3	0–25
Li_2O	0.5–5	PbO + Sb_2O_3	20–50
Na_2O	0–10	BaO	0–20
$Li_2O + Na_2O$	0.5–10	Nb_2O_5	13–21.5
PbO	0–40	F	1–12

4,433,063

HYDROGEN SORBENT COMPOSITION

Philip Bernstein, Glen Ridge, N.J.; James P. Coffey; Alan E. Varker, both of Warwick, N.Y.; John T. Arms, Monroe, N.Y.; William D. K. Clark, Warwick, N.Y., and Paul D. Goodell, Ridgewood, N.J., assignors to MPD Technology Corporation, Wyckoff, N.J.

Continuation-in-part of Ser. No. 226,455, Jan. 19, 1981, abandoned. This application Jan. 25, 1982, Ser. No. 342,072

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ B01J *20/26, 31/06*

U.S. Cl. 502—402 **19 Claims**

1. A hydrogen sorbent composition comprising a hydridable material encradled throughout a fiber-containing polymeric

material having interconnecting pores therethrough, said composition being developed from a substantially dry mixture of compatible and non-reactive components consisting essentially of:

(A) a particulate hydridable material, a fibrillatable organic polymer and a major amount of removable pore-former, said pore-former being an organic polymer having a molecular weight of about 100,000 to about 1,000,000 and characterized in that it melts below the temperature at which any of the components of the mixture may react with each other, or

(B) a particulate hydridable material, a fibrillatable organic first polymer, a support-contributing second polymer and a major amount of removable pore-former;

said porosity of the composition being developed in the mixture of components on removal of the pore-former after fibrillation of the fibrillatable polymer, whereby accessibility to the hydridable material in the composition is maximized.

12. A hydrogen sorbent composition, said composition being porous and comprising a hydridable material, discrete fibrils obtained from a fibrillatable first organic polymer, and a support-contributing second polymer, said hydridable material being distributed throughout the composition, and said composition being developed by processing of the components of the composition in the presence of a major amount of a removable pore-former and said porosity being developed on the removal of the pore-former, whereby accessibility to the hydridable material in the composition is maximized.

17. A hydrogen sorbent composition comprising a hydridable material encradled throughout a fiber-containing polymeric material having interconnecting porosity therethrough, said composition being developed from a substantially dry mixture of compatible and non-reactive components consisting essentially of:

(A) a particulate hydridable material, a fibrillatable organic polymer, and a major amount of removable pore-former, or

(B) a particulate hydridable material, a fibrillatable organic first polymer, a support-contributing second polymer and a major amount of removable pore-former;

said pore-former being an organic polymer having a molecular weight of about 100,000 to 1,000,000 and being present in the mixture of component in the amount of about 70% to about 80% by volume, and said porosity of the composition being developed in the mixture of components on removal of the pore-former after fibrillation of the fibrillatable polymer, whereby accessibility to the hydridable material in the composition is maximized.

4,433,064

METHOD FOR IMPARTING RESISTANCE TO AXIAL DISPLACEMENT OF CONVOLUTIONS IN A CONVOLUTED CATALYST SUBSTRATE

Thomas E. Pignon, Sonning Common, Near Reading, England, assignor to Johnson Matthey Public Limited Company, London, England

Continuation-in-part of Ser. No. 223,085, Jan. 7, 1981, abandoned. This application May 24, 1982, Ser. No. 381,506

Claims priority, application United Kingdom, Feb. 19, 1980, 8005480

Int. Cl.³ B01J 35/04

U.S. Cl. 502—527 **5 Claims**

1. A method for imparting resistance to axial displacement of convolutions in a convoluted substrate of the type suitable for use in a catalyst unit, comprising a substrate coated with a layer of refractory oxide and useful in the purification of exhaust gases, the substrate comprising convolutions of superimposed plain and corrugated strips of metal wound around a common axis to form a generally cylindrical substrate having end faces transverse to the axis of the cylindrical substrate wherein convolutions of plain metal strip are spaced apart by convolutions of corrugated metal strip to define a plurality of passageway channel extending axially between the end faces of the substrate so that exhaust gas under pressure can pass axially through the substrate wherein the method comprises making from one to four weld runs each across a diameter of one of the end faces of the substrate so as to bridge superimposed convolutions of plain and the corrugated strip thereby increasing the resistance of the bridged convolutions to axial displacement relative to each other in response to displacing forces generated by exhaust gases passing through the channels.

4,433,065

PROCESS FOR THE PREPARATION OF HYDROCARBONS FROM CARBON-CONTAINING MATERIAL

Maarten J. van der Burgt; Sikke J. A. Boelema; Willem J. A. H. Schoeber, all of The Hague, and Pieter L. Zuideveld, Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1982, Ser. No. 355,065

Claims priority, application Netherlands, Mar. 24, 1981, 8101447

Int. Cl.³ C07C 1/04

U.S. Cl. 518—703 **8 Claims**

1. A process for the preparation of hydrocarbons from coal comprising the following steps:

(a) a finely comminuted coal is converted by gasification at a temperature from 1050° to 2000° C. in the presence of oxygen and steam into a gas mixture consisting substantially of carbon monoxide and hydrogen;

(b) the gas mixture obtained in step (a) is partially converted into a aromatic hydrocarbon mixture with the use of a bifunctional crystalline silicate catalyst which

(i) is capable of adsorbing more than 3% by weight of water at 25° C. and saturated water vapor pressure after dehydration at 400° C. in vacuo, and

(ii) has, in the dehydrated form, the following gross composition, expressed in moles of the oxides:

$$(1.0\pm0.3)(R)_{2/n}O.\ a\ Fe_2O_3.\ b\ Al_2O_3.\ c\ Ga_2O_3.\ y(d\ SiO_2+e\ GeO_2),$$

wherein

R=one or more mono- or bivalent cations,

$a \geqq 0.1$,

$b \geqq 0$,

$c \geqq 0$,

$a+b+c=1$,

$y \geqq 10$,

$d \geqq 0.1$,

$e \geqq 0$,

$d+e=1$, and

n=the valency of R, and

(iii) which contains one or more metal components with catalytic activity for conversion of an H_2/CO mixture into hydrocarbons and/or oxygen-containing hydrocarbons;

(c) the product of step (b) is separated into a liquid containing hydrocarbon with at least 3 carbon atoms and a gas containing unconverted hydrogen, carbon monoxide, nitrogen and resultant hydrocarbon gases; and

(d) at least a part of the gas product of step (c) is separated into (i) a gas consisting substantially of hydrogen, (ii) a gas consisting substantially of carbon monoxide, nitrogen and argon, and (iii) a gas consisting substantially of methane and ethane and wherein at least a part of gas (i) is recycled to step (b) and at least a part of gas (iii) is recycled to step (a).

4,433,066

METHOD FOR THE PREPARATION OF HIGH-CALORIC GASES, PARTICULARLY METHANE, BY MEANS OF A CATALYST FLUIDIZED BED

Erich Hackler; Claus Flockenhaus, both of Essen, and Werner Lommerzheim, M heim, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen

Filed Jan. 19, 1982, Ser. No. 340,738

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1981, 3101739

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—706 2 Claims

1. In a method for the production of methane wherein feed gases containing CO and H_2 are passed through a fluidized catalytic bed having cooling elements therein, the improvement which comprises carrying out the conversion in at least two fluidized bed reactors and wherein the feed gas is introduced to the first reactor under pressure and to the subsequent reactors under a pressure which is less than the pressure of the preceding reactor, a portion of the gas produced in each reactor is fed to a collecting line, another portion of the gas produced from each reactor is fed to the next reactor as a diluting gas and still another portion of the gas produced in the first stage is compressed and returned to the first stage as a recycled diluting gas.

4,433,067

REACTION INJECTION MOLDED ELASTOMERS PREPARED FROM AMINE TERMINATED POLYETHERS, AMINE TERMINATED CHAIN EXTENDER AND AROMATIC POLYISOCYANATE

Doris M. Rice, and Richard J. G. Dominguez, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,160

The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—51 22 Claims

1. A reaction injection molded elastomer made by reacting in a closed mold ingredients comprising amine terminated polyethers of greater than 1,500 average molecular weight having greater than 50% of their active hydrogens in the form of amine hydrogens, an amine terminated chain extender and an aromatic polyisocyanate.

4,433,068

PROCESS FOR PRODUCING BONDED MACROBALLOON STRUCTURES AND RESULTING PRODUCT

John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021, and John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 423,802, Sep. 27, 1982, Pat. No. 4,407,980. This application Feb. 17, 1983, Ser. No. 467,263

Int. Cl.³ C08J *9/24*

U.S. Cl. 521—54 16 Claims

1. A process for producing high temperature and flame resistant macroballoon structures which comprises the steps of:

reacting an oxoimine having the general formula:

$$CH_2—(CH_2)—HNCO$$

where "X" is a positive integer from 2 to 4 with an aromatic tetracarboxylic acid dianhydride in a mole ratio thereof between about 0.05:1 and 1.5:1 to produce an N-substituted imide;

esterfying said N-substituted imide by mixing therewith a reactive solvent;

adding thereto at least one diamine;

drying the resulting liquid composition;

reducing the dried material to an average particle diameter of from about 0.5 to 10 mm.;

separating said particles from each other;

heating said particles to a temperature in the range of about 90° to 150° C. while substantially preventing interparticle contact, whereby said particles expand producing a plurality of discrete macroballoons;

coating said macroballoons with a thin layer of a liquid bonding agent;

bringing said macroballoons into contact with each other in a desired structural configuration; and

curing said bonding agent to a dry state;

whereby a lightweight structure of bonded macroballoons results.

4,433,069

METHOD FOR PREPARING FLAME RESISTANT POLYSILOXANE FOAMS AND FOAMS PREPARED THEREBY

Jack R. Harper, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 3, 1983, Ser. No. 455,431

Int. Cl.³ C08J *9/02*

U.S. Cl. 521—99 29 Claims

1. A cured, flame retardant polyorganosiloxane in the form of a blown foam containing

(1) at least five parts by weight per million parts by weight of said foam of platinum in elemental or chemically combined form, said foam having uniformly dispersed therein

(2) at least 0.1%, based on the weight of said foam, of at least one finely divided nonmetallic, fibrous heat resistant material, and

(3) at least 0.1%, based on the weight of said foam, of at least one finely divided nonmetallic, cellular heat resistant material,

wherein the combined concentrations of fibrous and cellular heat resistant materials do not exceed 40% of the total weight of said foam and the heat resistant materials do not soften or decompose below 1500° C.

4,433,070

CULTURED ONYX PRODUCTS AND METHODS THEREFOR

Gilbert B. Ross, 17640 Vincennes St., Northridge, Calif. 91324, and Theodore E. Stevens, 295 View Crest Dr., Azusa, Calif. 91702

Filed May 5, 1980, Ser. No. 146,749

Int. Cl.³ C08L *67/06*

U.S. Cl. 523—171 26 Claims

1. A shaped structure having a polishable cultured onyx, cultured marble, or like mineral-appearing surface of predetermined hardness, said structure comprising a locally discontinuous phase comprising a synthetic organic resin portion hardened to said predetermined hardness and a visually distinguishable continuous phase comprising a synthetic organic resin portion separately hardened to said predetermined hardness with said discontinuous phase intimately distributed therein, whereby said structure surface is simulative of onyx or like mineral appearance and uniformly polishable in phase undifferentiated relation.

4,433,071

FLAME AND DRIPPING EMBER RETARDANT FLEXIBLE POLYURETHANE FOAMS

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 14, 1982, Ser. No. 449,719
Int. Cl.³ C08G 18/14
U.S. Cl. 521—107 19 Claims

1. In a process for preparing flexible polyurethane foam by the reaction of a polyester polyol and an organic polyisocyanate wherein the improvement comprises:

adding to the polyurethane forming reactants a blowing agent comprising water, polyurethane forming catalyst, surfactant, and a flame and dripping ember retardant effective amount of an additive combination comprising (1) halogenated flame retardant, and (2) water or alcohol soluble uncrosslinked urea-formaldehyde resin which is unreactive with said organic polyisocyanate.

4,433,072

MIXTURES OF POLYMERS FOR MEDICAL USE

Christian Pusineri, Serezin du Rhone, and Jean Goletto, Ecully, both of France, assignors to Hospal-Sodip, S.A., Meyzieu, France

Division of Ser. No. 417,323, Sep. 13, 1982, Pat. No. 4,394,462, which is a division of Ser. No. 103,894, Dec. 17, 1979, Pat. No. 4,408,026. This application Apr. 29, 1983, Ser. No. 489,707
Claims priority, application France, Dec. 15, 1978, 78 36065
Int. Cl.³ C08J 3/00
U.S. Cl. 523—105 10 Claims

1. Polymer compositions, useful especially in the medical field, consisting of a mixture of vinyl chloride polymer and a polyether—urethane with tertiary amine and/or ammonium groups and heparin, with the porportion of the polyether—urethane being from 1 to 99% by weight, relative to the total mixture.

4,433,073

OLEFINIC POLYMER COMPOSITION CONTAINING INORGANIC FILLER

Hironari Sano, Suzuka, and Hiroshi Yui, Yokkaichi, both of Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,734
Claims priority, application Japan, Jul. 17, 1980, 55-96825
Int. Cl.³ C08K 9/04, 3/26; C08L 33/02
U.S. Cl. 523—201 11 Claims

1. A high impact olefinic polymer composition comprising

(1) a continuous matrix of a crystalline olefinic polymer which is selected from a crystalline homopolymer of ethylene or propylene, and a crystalline copolymer consisting essentially of a major proportion of at least one monomer selected from the group consisting of ethylene and propylene with a minor proportion of another ethylenically unsaturated monomer,

(2) a dispersed phase of an impact absorbing rubbery polymer component or its composite dispersed in the matrix,

(3) a finely divided inorganic filler having a particle diameter less than 2 microns and smaller than that of the dispersed phase, said inorganic filler being filled substantially entirely in said dispersed phase,

(4) said dispersed phase being selected from the group of the following types I–IV:

I. a dispersed phase consisting of

(A') a reactive derivative of a crystalline olefinic polymer which cannot be uniformly mixed with the olefinic polymer forming the matrix, or

(B) a composition composed of a crystalline olefinic polymer (A) and the reactive derivative of the crystalline olefinic polymer (A'),

said (A') or (B) being surrounded by

(C) an impact absorbing rubbery polymer, and said inorganic filler (3) being filled in said (A) or (B);

II. a dispersed phase consisting of

(C') a reactive derivative of an impact absorbing rubbery polymer (C), or

(D) a composition composed of the rubbery polymer (C) and the reactive derivative of the rubbery polymer (C'), and

said inorganic filler (3) being filled in the component (C') or (D),

III. a dispersed phase consisting of

(A) a crystalline olefinic polymer which cannot be uniformly mixed with the olefinic polymer forming the matrix,

said (A) being surrounded by

either (C') a reactive derivative of an impact absorbing rubbery polymer or (D) a composition composed of the rubbery polymer (C) and the reactive derivative of the rubbery polymer (C'), and

said inorganic filler (3) being filled in said component (C') or (D), and

IV. a dispersed phase consisting of

(A') a reactive derivative of a crystalline olefinic polymer which cannot be uniformly mixed with olefinic polymer forming the matrix, or

(B) a composition composed of a crystalline olefinic polymer (A) and the reactive derivative of the crystalline olefinic polymer (A'), said (A') or (B) being surrounded by either

(C') a reactive derivative of an impact absorbing rubbery polymer, or

(D) a composition composed of the rubbery polymer (C) and the reactive derivative of the rubbery polymer (C') and

said inorganic filler (3) being filled in both (A') or (B) and (C') or (D), and

(5) said impact absorbing rubbery polymer (C) being an ethylene/propylene copolymer rubber, an ethylene/-propylene/nonconjugated diene terpolymer, an ethylene/butene copolymer rubber, a styrene/conjugated diene copolymer, or a polydiolefin, and

(6) said reactive derivative of an impact absorbing rubbery polymer having hydrophillic groups introduced in the impact absorbing rubbery polymer, and

(7) said reactive derivative of a crystalline olefinic polymer having hydrophillic groups introduced in the crystalline olefinic polymer which cannot be uniformly mixed with the crystalline olefinic polymer forming the matrix.

4,433,074

DISCONTINUOUS FIBER PRETREATMENT

David H. Hawes, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,229
Int. Cl.³ C08K 7/02, 9/10
U.S. Cl. 523—207 6 Claims

1. An improved method of incorporating unregenerated discontinuous cellulose fibers within a vulcanizable elastomeric matrix including a fiber pretreatment which consists essentially of mixing from 3% to 15% by weight vinyl pyridine latex with an aqueous slurry of essentially delignified bleached hardwood fibers, said slurry having a consistency of from 10% to 35% subsequently expressing water and drying the treated fiber, wherein the improvement comprises hardwood fibers which have not been subjected to post-delignification drying.

4,433,075

QUALITY CONTROL PROCEDURE FOR DETERMINING PARTICLE CONCENTRATION IN POLYMERS

Paul C. Warren, Far Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1982, Ser. No. 441,222

Int. Cl.³ C08J 3/00; C08K 3/04

U.S. Cl. 523—303 **9 Claims**

1. A method for manufacturing a product that comprises a polymer composition that includes particles, said method comprising the steps of obtaining a representative portion of said polymer composition, preparing said representative portion, and performing a spectroscopic measurement on said prepared portion characterized in that said preparation comprises substantially dissolving said portion in a solvent in the substantial absence of the dissolution of said particles to form said prepared portion, measuring the level of light transmitted through said prepared portion, and from said measured level determining the suitability of said polymer composition.

4,433,076

COATING AGENT FOR MEDICAMENTS AND METHODS FOR MAKING AND USING THE SAME

Kurt H. Bauer; Hermann Osterwald, both of Freiburg; Klaus Lehmann, Rossdorf, and Dieter Dreher, Bickenbach, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,486

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049179

Int. Cl.³ A01N 25/10

U.S. Cl. 523—342 **7 Claims**

1. The method for making an aqueous suspension of a synthetic resin copolymer, which suspension is adaptable to use for forming a coating on a medicament core to form an orally-ingestible pharmaceutical dosage unit form, which method comprises suspending powder granules of said copolymer, formed by spray drying an aqueous dispersion of said copolymer, in an aqueous solution of a plastizer for said copolymer or in an aqueous suspension of a plasticizer for said copolymer, said powder granules having a diameter between 20 and 60 microns and comprising loosely aggregated primary particles having a diameter of less than one micron, said copolymer comprising (a) 5 to 80 percent by weight of a water-soluble vinyl monomer selected from the group consisting of α, β-unsaturated mono- and dicarboxylic acids and the amides, the hydroxy lower alkyl esters, the monoalkyl- and dialkyl-amino lower alkyl esters, and the quaternary ammonium salts of such amino lower alkyl esters of said acids, vinyl pyrrolidone, and vinyl imidazole; and (b) 95 to 20 percent by weight of a monomer selected from the group consisting of styrene, vinyl acetate, olefins, and alkyl esters of acrylic acid and methacrylic acid having 1 to 10 carbon atoms in the alkyl portion thereof; the relative amounts of monomers (a) and (b) in said copolymer being such that the minimum film-forming temperature thereof is greater than 80° C., said copolymer further being water-insoluble in one portion of the region between pH 1.5 and 8 and water-soluble or water-swellable in another portion of said region.

4,433,077

PROCESS FOR PREPARING CURABLE COMPOUNDS

Keith A. Callander, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Aug. 23, 1982, Ser. No. 410,654

Claims priority, application Canada, Sep. 23, 1981, 386486

Int. Cl.³ C08L 93/04

U.S. Cl. 523—344 **7 Claims**

1. A process for the production of soft compounds which are curable by heat to rubbery elastomers which process comprises the steps of:

adding to a trough type blade mixer one or more inorganic fillers, organic tackifying resin, a butadiene-acrylonitrile polymer and an organic peroxidic compound polymerizable monomer having two or three polymerizable carbon-carbon double bonds, said trough type blade mixer being selected from the group consisting of sigma-blade mixers, Z-blade mixers, horizontal dispersion-blade mixers and double Naben-blade mixers,

initiating the mixing in said mixer and continuing mixing for a time of from about 5 to about 30 minutes,

then adding to said mixer organic plasticizer and continuing mixing for a time of from about 5 to about 30 minutes,

then adding to said mixer an organic peroxidic compound and continuing mixing for a time of from about 5 to about 30 minutes,

said mixing being at a temperature of from about 20° to about 50° C.,

and removing the final mixture from said mixer as an essentially homogeneous soft compound.

4,433,078

WATERDISPERSIBLE CATIONIC RESINS FOR ELECTRODEPOSITION

Hilde Kersten, Erlenbach; Hans G. Zengel, Kleinwallstadt, both of Fed. Rep. of Germany, and Anton Toth, Creil, France, assignors to Akzo NV, Arnhem, Netherlands

Filed Dec. 3, 1980, Ser. No. 212,671

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014733

Int. Cl.³ C08L 63/08

U.S. Cl. 523—404 **16 Claims**

1. Water dispersible cationic resins for obtaining films with low pin hole formation and improved breakdown voltage, comprising the product of reaction of at least

(A) an epoxidized polydiene,

(B) a bisglycidylether of a polyphenol,

(C) an amide compound, which is formed by one or more higher, substantially multiply unsaturated fatty acids and a polyamine and which may comprise a ketimine group or a hydroxy group, and if necessary

(D) an organic secondary amine, at temperature from about 100° to 150° C., and/or

(E) a partially and/or fully masked polyisocyanate, at temperature below about 100° C., which product comprises excess epoxide groups and carbon-carbon double bonds.

4,433,079

WATER-DISPERSION ADHESIVE FOR EXTRUSION LAMINATION

Noriyuki Kobayashi, and Akihiko Funamoto, both of Chiba, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,698

Claims priority, application Japan, Mar. 19, 1982, 57-43916

Int. Cl.³ C08G 59/18; C09J 3/16

U.S. Cl. 523—404 **7 Claims**

1. Water-dispersion adhesives for extrusion lamination which comprise a dispersion of a resin in water, wherein the resin (A) is obtained from a reaction of a polyepoxy compound (B) with a reaction mixture (C) of a polyethyleneimine (D) and a monoepoxy compound (E).

4,433,080

WATER-BORNE HERMETIC VARNISH

Deno Laganis, Schenectady, and John Yodis, Amsterdam, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,387

Int. Cl.³ C08L 61/10, 63/00, 63/02

U.S. Cl. 523—414 **19 Claims**

1. A hydrolytically stable, heat-curable composition suitable for use as a hermetic varnish for coating wire made of copper, silver or aluminum, which consists essentially of an aqueous

solution of (1) a water-reducible, epoxy adduct which is a reaction product of

(A) an epoxy resin which is a glycidyl ether of a dihydric phenol containing 1.3 to 2 epoxide groups per molecule and having an epoxy equivalent of about 600 to 1200,

(B) aminobenzoic acid in an amount of 0.60 to 1.50 moles per epoxide equivalent weight,

(C) a water-soluble organic solvent having a boiling point above 150° C. which is a glycol ether, a glycol ether carboxylic acid ester, an unsubstituted ketone or a ketone alcohol or a blend of such a solvent with up to 35% of a glycol ether and/or alkanol boiling below 150° C.,

(D) sufficient quantity of a water soluble amine which is a tertiary alkyl amine, morpholine, N-(2-hydroxyethyl) morpholine or an alkanolamine to render the epoxy adduct soluble in water, (2) a water soluble or water reducible phenolic cross-linking agent which is a 2,2-bis(4-hydroxyphenyl)propane-formaldehyde resin having a 2,2-bis(4-hydroxyphenyl)propane to formaldehyde ratio of 1:2.0 to 3.5 on a molar basis, the phenolic cross-linking agent being 10 to 60% of the total of the phenolic and epoxy resin coating solids, the coating solids being not over 60% of the aqueous solution, the organic solvent being 30 to 90% of the total of organic solvent and water.

4,433,081

ELECTRICAL INSULATION BODY

Helmut Britsch, Schinznach-Dorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 27, 1982, Ser. No. 343,266

Claims priority, application Switzerland, Feb. 11, 1981, 922/81

Int. Cl.³ C08K *3/36, 3/10*

U.S. Cl. 523—457 **10 Claims**

1. An electrical insulation body in an environment of SF_6 gas comprising a matrix of a thermoset resin and a mineral filler, with the mineral filler comprising predominantly quartz powder and from about 5 to 50 percent by weight of said mineral filler of a second mineral powder component for increasing resistance to SF_6 cleavage products, which component comprises at least one alkaline earth metal carbonate.

4,433,082

PROCESS FOR MAKING LIQUID COMPOSITION OF PERFLUORINATED ION EXCHANGE POLYMER, AND PRODUCT THEREOF

Walther G. Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1981, Ser. No. 259,506

Int. Cl.³ C08D *5/20*

U.S. Cl. 524—755 **34 Claims**

1. A process for making a liquid composition of a perfluorinated ion exchange polymer having $—SO_3M$ functional groups wherein M is H, Na, K or NR_4, and each R is separately H, CH_3 or C_2H_5, in a liquid medium, said liquid composition being liquid at room temperature, said process comprising contacting a said polymer having an equivalent weight in the range of 1025 to 1500 with a mixture comprising 20 to 90% by weight of water and 10 to 80% by weight of at least one member of the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, 2-butanol, 2-methoxyethanol, 2-ethoxyethanol, ethylene glycol dimethyl ether, ehtylene glycol diethyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, dioxane and acetonitrile at a temperature in the range of about 180° to 300° C. and below the critical temperature(s) of said member(s) employed, for at least 0.5 hour in a closed vessel, and separating from said liquid composition any lower density liquid phase present.

4,433,083

COMPOSITIONS OF MELT-PROCESSABLE POLYMERS HAVING IMPROVED PROCESSABILITY

Frederic N. Cogswell, Welwyn Garden City; Brian P. Griffin, St. Albans, and John B. Rose, Letchworth, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 207,708, Nov. 17, 1980, Pat. No. 4,389,174. This application Jun. 9, 1982, Ser. No. 386,683

Claims priority, application United Kingdom, Nov. 30, 1979, 7941364; Nov. 30, 1979, 7941365

The portion of the term of this patent subsequent to May 11, 2000, has been disclaimed.

Int. Cl.³ C08L *1/08;* C08G *18/00, 59/19, 83/00*

U.S. Cl. 524—27 **10 Claims**

1. A melt-processable polymer composition comprising at least one polymer capable of forming an anisotropic melt and at least one other melt-processable polymer characterised in that the temperature range over which the polymer can form an anisotropic melt and the temperature range over which the melt-processable polymer may be melt processed overlap, with the proviso that the other melt-processable polymer may not become melt processable until blended with the anisotropic-melt-forming polymer.

4,433,084

HIGH-FLOAT, RAPID-SETTING EMULSION

Larry F. Ostermeyer, and Michael N. Guerin, both of West Lafayette, Ind., assignors to K. E. McConnaughay, Inc., Lafayette, Ind.

Continuation-in-part of Ser. No. 381,543, May 24, 1982, abandoned. This application Sep. 28, 1982, Ser. No. 425,395

Int. Cl.³ B01J *13/00;* C08L *95/00*

U.S. Cl. 524—62 **50 Claims**

1. A method of manufacturing a high-float, rapid-setting emulsion which comprises first mixing, by weight of the finished emulsion, about 60% to about 80% asphalt with about 0.05% to about 4% tall oil, tall oil derivatives or mixtures thereof, and then combining and mixing said mixture with treated water comprising, by weight of the finished emulsion, 0% to about 4% tall oil, tall oil derivatives or mixtures thereof, from 0% to about 1% strong base and about 25% to about 35% water.

9. A method of manufacturing a high-float, rapid-setting emulsion which comprises first mixing about 60% to about 80% asphalt with about 0.1% to about 3.2% reacted tall oil, tall oil derivatives, or mixtures thereof, said reacted tall oil, tall oil derivatives or mixtures thereof comprising tall oil, tall oil derivatives or mixtures thereof reacted with 10%, by weight of the tall oil, tall oil derivatives or mixtures thereof in the reacted tall oil, tall oil derivatives or mixtures thereof, of a strong base, and then mixing and combining the asphalt-reacted tall oil, tall oil derivatives, or mixtures thereof mixture with treated water comprising about 0.1% to about 1% tall oil, tall oil derivatives or mixtures thereof, from 0 to about 1% strong base, and about 25% to about 35% water.

4,433,085

TRIAZOLIDINE-3,5-DIONE/FORMALDEHYDE/AMINE CONDENSATES AND COMPOSITIONS THEREOF

Ludwig Rottmaier, Odenthal, and Rudolf Merten, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

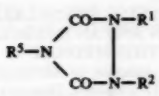
Filed Jun. 29, 1981, Ser. No. 278,860

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027582

Int. Cl.³ C07D *403/04;* C08K *5/34, 5/35*

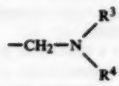
U.S. Cl. 524—83 **18 Claims**

1. A compound of the formula



wherein

R^1 and R^2, independently of one another are each hydrogen, alkylcarbonyl having 2 to 21 carbon atoms or



wherein

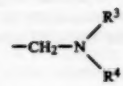
R^3 is hydrogen, alkyl having 1 to 20 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, unsubstituted aralkyl having up to 14 carbon atoms in the aryl moiety and up to 2 carbon atoms in the alkyl moiety, unsubstituted aryl having 6 to 14 carbon atoms, or a heterocyclic radical selected from the group consisting of a radical of pyrrolidine, piperidine, pyrazolidine, imidazolidine, oxazolidine, thiazolidine, piperazine, morpholine, thiomorpholine, hydantoin, 5,5-dimethylhydantoin, parabanic acid, barbituric acid and cyanuric acid and

R^4 is alkyl having 1 to 20 carbon atoms, alkenyl having 2 to 20 carbon atoms, unsubstituted aralkyl having up to 14 carbon atoms in the aryl moiety and up to 2 carbon atoms in the alkyl moiety, unsubstituted aryl having 6 to 14 carbon atoms, or a heterocyclic radical selected from the group consisting of a radical of pyrrolidine, piperidine, pyrazolidine, imidazolidine, oxazolidine, thiazolidine, piperazine, morpholine, thiomorpholine, hydantoin, 5,5-dimethylhydantoin, parabanic acid, barbituric acid and cyanuric acid, alkylcarbonyl having 2 to 21 carbon atoms, alkenylcarbonyl having 3 to 21 carbon atoms or alkoxycarbonyl having 2 to 20 carbon atoms, or

wherein

R^3 and R^4, together with the nitrogen atom to which they are attached, form a nitrogen-containing heterocyclic radical selected from the group consisting of a radical of pyrrolidine, pyrazolidine, imidazolidine, oxazolidine, thiazolidine, triazolidine, tetrazolidine, thiodiazolidine, piperidine, piperazine, morpholine, thiomorpholine, azacyclobutane and azacycloheptane, and

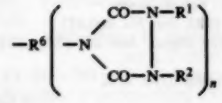
R^5 is alkyl having 1 to 20 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, unsubstituted aralkyl having up to 14 carbon atoms in the aryl moiety and up to 2 carbon atoms in the alkyl moiety, unsubstituted aryl having 6 to 14 carbon atoms, alkylcarbonyl having 2 to 21 carbon atoms or



wherein

R^3 and R^4 are as aforesaid or

R^5 is of the formula



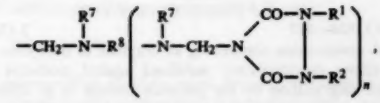
wherein

R^6 is a (n+1)-valent C_1–C_{20} aliphatic, C_3–C_{10} cycloaliphatic, C_8–C_{16} araliphatic or C_6–C_{14} aromatic hydrocarbon radical or one of said hydrocarbon radicals mono- or di-substituted by halogen, hydroxyl, C_1–C_4-alkoxy, cyano, amino, C_1–C_4-alkylamino, bis-(C_1–C_4-alkyl)-amino, C_2–C_4-alkoxycarbonyl or C_1–C_4-alkyl,

R^1 and R^2 are as aforesaid and

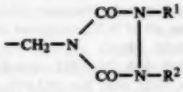
n is 1 or 2 or

R^5 is of the formula



wherein

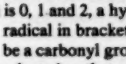
R^7 is hydrogen, alkyl having 1 to 20 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, unsubstituted aralkyl having up to 14 carbon atoms in the aryl moiety and up to 2 carbon atoms in the alkyl moiety, unsubstituted aryl having 6 to 14 carbon atoms, a heterocyclic radical selected from the group consisting of a radical of pyrrolidine, piperidine, pyrazolidine, imadazolidine, oxazolidine, thiazolidine, piperazine, morpholine, thiomorpholine, hydantoin, 5,5-dimethylhydantoin, parabanic acid, barbituric acid and cyanuric acid or



R^8 is a (m+1)-valent C_1–C_{20}-aliphatic, C_3–C_{10}-cycloaliphatic, C_8–C_{16}-araliphatic, C_6–C_{14}-aromatic hydrocarbon radical or one of said hydrocarbon radicals mono- or di-substituted by halogen, hydroxyl, C_1–C_4-alkoxy, cyano, amino, C_1–C_4-alkylamino, bis-(C_1–C_4-alkyl)-amino, C_2–C_4-alkoxycarbonyl or C_1–C_4-alkyl,

R^1 and R^2 are as aforesaid and

m is 0, 1 and 2, a hydrogen atom being present instead of the radical in brackets if m is 0 and it being possible for R^8 to be a carbonyl group when m is 1, said R^1, R^2 and R^5 being selected so that said compound of said formula contains at least one group of the formula



18. A polyamide molding composition containing, as a flame-proofing agent, a compound of claim **1**.

4,433,086

HEAT STABILIZED POLYMERS

Alva F. Harris, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1981, Ser. No. 332,054

Int. Cl.³ C08K 5/09

U.S. Cl. 524—112 **7 Claims**

1. A polymer composition of improved stability comprising polymerized units derived from a vinylaromatic monomer, an ethylenically unsaturated anhydride monomer, and an ethylenically unsaturated nitrile monomer and from 0.1% to 8% by weight based on the composition weight of a tetrahalogenated aromatic dicarboxylic acid or anhydride of such an acid.

4,433,087

ALKYLATED 2,2'-BIPHENYLENE PHOSPHONATES AND STABILIZED COMPOSITIONS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 75,289, Sep. 12, 1979, abandoned, which is a continuation of Ser. No. 964,407, Nov. 28, 1978, abandoned, which is a continuation of Ser. No. 866,749, Jan. 3, 1978, abandoned. This application May 26, 1981, Ser. No. 267,116

Int. Cl.³ C08K 5/52; C07F 9/15

U.S. Cl. 524—117 3 Claims

1. A composition comprising an ethylene or propylene homopolymer or copolymer stabilized against oxidative and thermal degradation by the presence therein of an effective stabilizing amount of (4,4',6,6'-tetra-tert.butyl-2,2'-biphenyl) phosphonate or (4,4'-dimethyl-6,6'-di-tert-butyl-2,2'-biphenylene) phosphonate.

2. The compound which is (4,4',6,6'-tetra-tert.-butyl-2,2'-biphenylene) phosphonate.

3. The compound which is (4,4'-dimethyl-6,6'-di-tert-butyl-2,2'-biphenylene) phosphonate.

4,433,088

POLYPHENYLENE ETHER COMPOSITIONS AND PROCESS

William R. Haaf, Voorheesville; James A. Huebner, Glenmont, and Arthur Katchman, Delmar, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 238,543, Feb. 26, 1981, abandoned. This application May 26, 1982, Ser. No. 382,078

Int. Cl.³ C08K 5/51

U.S. Cl. 524—153 15 Claims

1. A composition comprising:

(a) a polyphenylene ether resin,

(b) a high impact polystyrene,

(c) an aromatic phosphate flame retardant agent, and

(d) an effective amount of an adhesion promoting agent consisting essentially of a low molecular weight polyolefin glycol, said composition being free from polyethylene.

4,433,089

INHIBITION OF POLYURETHANE HARDENING

C. Neil Keeney, Chesterfield, Mo.; Paul W. May, Jr., Fairview Heights, and Albert W. Morgan, Collinsville, both of Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 942,231, Sep. 14, 1978, Pat. No. 4,349,640. This application Jun. 10, 1982, Ser. No. 386,835

Int. Cl.³ C08K 5/12

U.S. Cl. 524—294 12 Claims

1. Composition consisting essentially of butyl benzyl phthalate and, based on the weight of said phthalate, from about 0.1% to about 5% ethylene glycol.

4,433,090

VISCOSITY MODIFIERS FOR ACRYLAMIDE POLYMER

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 9, 1983, Ser. No. 502,830

Int. Cl.³ C08F 2/38

U.S. Cl. 524—295 9 Claims

1. An acrylamide polymer comprising acrylamide and a sufficient amount of cinnamic acid to substantially reduce the viscosity of the acrylamide polymer in solution.

4,433,091

PAINT MEDIUM FOR APPLYING OVERGLAZE DECORATION TO PORCELAIN AND AN OVERGLAZE PAINT ON BASIS OF THIS MEDIUM

Peter Poulsen, Lyngby, Denmark, assignor to Aktieselskabet Den kongelige Porcelainsfabrik, Copenhagen, Denmark

Filed Apr. 26, 1982, Ser. No. 371,987

Claims priority, application Denmark, May 6, 1981, 2010/81

Int. Cl.³ C08K 5/05; C08L 39/06

U.S. Cl. 524—386 6 Claims

1. In a non-turpentine, water-soluble, liquid paint medium for overglaze decoration of procelain the improvement of a medium consisting essentially of, by weight:

15 to 40% of polyvinyl pyrrolidone or a mixture of polyvinyl pyrrolidone and aqueous polyethylene oxide;

45 to 85% of ethylene glycol, propylene glycol, a mixture of ethylene glycol and propylene glycol, or a mixture of any of the foregoing with water;

wherein the following ingredients are present in amounts up to:

5% of a non-ionic block copolymer of 2,000 molecular weight of which about 1,750 is propylene oxide and about 250 is ethylene oxide;

20% of butyl diglycol; and

5% of glycerol.

4,433,092

GREEN CERAMIC OF LEAD-FREE GLASS, CONDUCTIVE CARBON, SILICONE RESIN AND $ALPO_4$, USEFUL, AFTER FIRING, AS AN ELECTRICAL RESISTOR

Joseph Nemeth, Harsens Island, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Continuation-in-part of Ser. No. 241,490, Mar. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 230,404, Jan. 30, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,194

Int. Cl.³ H01C 7/00; C03C 3/08, 3/16

U.S. Cl. 524—414 4 Claims

1. A lead-free green ceramic body useful after firing as an electrical resistor and consisting essentially, on a solids basis, of from 60 to 75 percent of a glass frit, from 5 to 15 percent $AlPO_4$, from $\frac{1}{4}$ to 4 percent conductive carbon and from 15 to 30 percent of a temporary binder which is a cured phenyl lower alkyl silicone resin, and wherein the glass frit consists essentially of from 0 to 5 percent Al_2O_3, from 25 to 45 percent SiO_2, from 17 to 25 percent B_2O_3, from 10 to 25 percent Na_2O, from 0 to 2 percent K_2O, from 2 to 10 percent CaO, from 5 to 20 percent BaO, from 2 to 5 percent Li_2O, from 0 to 2 percent MgO, from 0 to 2 percent TiO_2, from 0 to 2 percent MoO_3 and from 0 to 4 percent F or consists essentially of substantially 30 percent SiO_2, 2 percent P_2O_5, 5 percent B_2O_3, 10 percent Na_2O, 10 percent K_2O, 10 percent Li_2O, 30 percent TiO_2 and 3 percent Fe_2O_3 or consists essentially of substantially 21 percent Al_2O_3, 44 percent P_2O_5, 7 percent B_2O_3, 21 percent Na_2O, 3 percent Li_2O, and 4 percent F.

4,433,093

ANTI-CREVICE CORROSION SEALANT AND METHOD FOR ANTI-CREVICE CORROSION

Shigeru Shida, Hitachi; Nobuyoshi Hosaka, Ibaraki; Yuichi Ishikawa, Mito, and Osamu Nishida, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,017

Claims priority, application Japan, Jan. 25, 1982, 57-8917; Jan. 25, 1982, 57-8918

Int. Cl.³ C08K 3/10, 3/02

U.S. Cl. 524—433 7 Claims

1. An anti-crevice corrosion sealant which comprises a rubbery substrate containing 5–350% by weight of fine zinc powder, 20–100% by weight of magnesium oxide, and

20–200% by weight of electrostatically charged fine graphite powder, each on the basis of the rubbery substrate.

4,433,094

PNEUMATIC TIRES COMPRISING AN IMPROVED THREAD

Masaki Ogawa, Sayama, and Mikihiko Ikegami, Tokorozawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 408,994

Claims priority, application Japan, Aug. 27, 1981, 56-133335

Int. Cl.³ C08K *3/04;* **C08L** *9/06;* **B60C** *11/00*

U.S. Cl. 524—496 **15 Claims**

1. In a pneumatic tire comprising a tread, the improvement wherein said tread is composed of a rubber composition comprising 10 to 120 parts by weight of carbon black having an iodine adsorption number of not less than 36 mg/g and a dibutyl phthalate adsorption number of not less than 60 ml/100 g and 0.4 to 5 parts by weight of a vulcanizing agent based on 100 parts by weight of rubber content consisting of 40 to 100 parts by weight of styrene-butadiene copolymer rubber (hereinafter referred to as SBR-A) and 0 to 60 parts by weight of at least one diene rubber other than SBR-A; said SBR-A having a content of bound styrene (S) of 10 to 30% by weight and a content of 1,2-bond in butadiene portion (V) of 40 to 70% by weight, which are within a range of $65 \leqq 1.7S + V \leqq 100$, and satisfying that an amount of styrene sequence consisting of not less than 11 styrene monomer units is not more than 10% by weight of the content of bound styrene and an amount of styrene sequence consisting of not more than 5 styrene monomer units is not less than 80% by weight of the content of bound styrene.

4,433,095

AQUEOUS ADHESIVES CONTAINING WATER-DISPERSIBLE POLYISOCYANATE PREPARATIONS

Rudolf Hombach; Helmut Reiff, both of Leverkusen; Wolfgang Wenzel, Bergisch-Gladbach, and Manfred Dollhausen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,077

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112117

Int. Cl.³ C08L *31/04*

U.S. Cl. 524—563 **6 Claims**

1. Aqueous adhesives comprising an aqueous polymer dispersion and a water-dispersible polyisocyanate having an average NCO-functionality of at least 2.2 and comprising

(a) an aromatic polyisocyanate having an NCO-functionality of at least 3 or a mixture of aromatic polyisocyanates having an average NCO-functionality of at least 2.2 and

(b) an emulsifier produced by reacting aromatic polyisocyanates with hydrophilic compounds containing isocyanate-reactive groups in an NCO/OH-equivalent ratio of at least 1:1, in a quantity sufficient to guarantee the dispersibility of the polyisocyanates.

4,433,096

POLYMERIZATION OF POLYDIORGANOSILOXANE IN THE PRESENCE OF FILLER

Gary N. Bokerman, and Neal R. Langley, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1983, Ser. No. 474,919

Int. Cl.³ C08K *3/10*

U.S. Cl. 524—783 **32 Claims**

1. A method of polymerizing a hydroxyl endblocked polydiorganosiloxane in the presence of filler comprising

(A) mixing (i) 100 parts by weight of polydiorganosiloxane of the formula

$$HO(R_2SiO)_xH$$

wherein each R is a monovalent radical having from 1 to 18 carbon atoms selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, and cyanoalkyl radicals, and x is from 3 to 200 and (ii) from 1 to 150 parts by weight of filler selected from the group consisting of inorganic reinforcing filler and inorganic extending filler to form a mixture,

(B) admixing sufficient catalyst of the formula

$$MO(R_2SiO)_zQ$$

wherein M is an alkali metal, tetraalkylphosphonium, or tetraalkylammonium radical; Q is an alkali metal, tetraalkylphosphonium, tetraalkylammonium, or hydrogen radical; R is as defined above; and z is at least 1, to cause condensation of the polydiorganosiloxane (i), and

(C) dehydrating the mixture by heating, at a temperature below that at which decomposition of the catalyst would occur, removing moisture for a time sufficient to polymerize the mixture, then

(D) inactivating the catalyst, to yield a stable silicone polymer-filler mixture in which the silicone polymer has a molecular weight greater than that of (i).

4,433,097

VINYL CHLORIDE RESIN TALC-EMBEDDED COMPOSITION AND METHOD OF MANUFACTURING SAME

Yoshihisa Tawada, Osaka; Tetsuro Yamamoto, Kobe; Minoru Ushioda, Amagasaki, and Kazuo Saito, Nishinomiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1981, Ser. No. 226,784

Claims priority, application Japan, Jan. 22, 1980, 55-6586; Feb. 12, 1980, 55-16195

Int. Cl.³ C08F *2/44, 14/06;* **C08L** *27/06;* **C08K** *3/34*

U.S. Cl. 524—789 **16 Claims**

1. A method of manufacturing vinyl chloride resin composition wherein talc is embedded within vinyl chloride base particles, comprising the steps of mixing said talc with either vinyl chloride monomer or a mixture of a vinyl chloride monomer in major proportions and other vinyl type monomer copolymerizable therewith in minor proportions, until said talc is substantially wetted with said monomer or monomer mixture; then adding to the resulting blend an aqueous medium and optionally a dispersant; and then polymerizing the resulting blend using an initiator soluble in said monomer or monomer mixture.

4,433,098

PROCESS FOR PREPARING A COPOLYMER AQUEOUS SOLUTION FROM WHICH A CATALYST RESIDUE IS REMOVED

Hiroyuki Itoh; Teruaki Yamanashi, and Hirosuke Imai, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Oct. 19, 1981, Ser. No. 312,821

Claims priority, application Japan, Oct. 23, 1980, 55-148518

Int. Cl.³ C08F *6/08*

U.S. Cl. 524—811 **13 Claims**

1. A process for preparing an aqueous solution of a butadiene-maleic anhydride copolymer from the polymerization liquid in which solution polymerization was carried out in the presence of azobisisobutyronitrile as a catalyst, which comprises the steps of:

adding water or a basic aqueous solution to the polymerization liquid;

distilling the polymerization solvent used for the solution polymerization; and then

distilling water and tetramethylsuccinonitrile with or without the addition of water or the basic aqueous solution.

4,433,099

PRODUCTION OF IMPACT-RESISTANT STYRENE POLYMERS

Friedrich-Wilhelm Küpper; Günter Padberg, both of Marl; Ulrich Reichert, Haltern, and Walter Trautmann, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,628

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018643

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—53 **4 Claims**

1. A method of producing impact-resistant modified styrene polymers having the characteristics: molecular weight M_w 150,000 to 170,000; gel content exceeding 22%, and a mean gel particle diameter of 1.7 to 4.5 microns, by continuously polymerizing a styrene solution of polybutadiene, possibly in the presence of diluents, in a cascade of at least three agitation vessels, at rising temperatures and in the presence of a peroxide initiator comprising:

(a) continuously introducing a solution of styrene consisting essentially of from about 8 to 10.5% by weight of polybutadiene rubber, based on said styrene and having more than 85% of a cis-1,4-structure into a first continuous stirred tank reactor, polymerizing said solution in the presence of about 1 to 7 m moles of an organic peroxide initiator having a single peroxide group or an equivalent amount of an organic peroxide initiator having a plurality of peroxide groups, said peroxide initiator having a half-life time exceeding 5 and less than 40 hours as measured in benzene at 100° C., said polymerizing being carried out for a residence time of about 0.8 to 1.6 hours with shearing agitation at temperatures of about 110° to 140° C., said dwell time being sufficient to produce a solid content of about 28 to 40% by weight;

(b) transferring the product of step (a) into at least one, but less than four additional continuous stirred tank reactors and continuing the polymerization at temperatures of about 130° to 160° C. for an additional residence time of about 1.0 to 1.8 hours in step (b) sufficient to produce a solid content of 60 to 73% by weight,

(c) transferring the product of step (b) into a further continuous stirred tank reactor and continuing the polymerization at a temperature of about 150° to 175° C. for an additional residence time of about 1.2 to 2.5 hours sufficient to produce a solid content exceeding 75% by weight and a residual organic peroxide initiator content less than 1% of the original amount; and

(d) removing volatile components at temperatures less than 260° C. under reduced pressures and recovering a product.

4,433,100

PRODUCTION OF NOVEL RESINS AND THEIR USES IN PRINTING INK COMPOSITIONS

James J. Laurito, Pittsburgh, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 260,935, May 8, 1981, abandoned, which is a continuation of Ser. No. 40,426, May 18, 1979, abandoned, which is a continuation of Ser. No. 839,408, Oct. 5, 1977, abandoned, which is a continuation of Ser. No. 434,270, Jan. 17, 1974, Pat. No. 4,056,498. This application Jul. 16, 1982, Ser. No. 399,003

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.³ C08F *216/06*

U.S. Cl. 525—54.42 **40 Claims**

1. A composition comprising:

(a) a predominant amount of dicyclopentadiene; and lesser amounts of

(b) at least one hydrocarbon selected from the group consisting of mono-olefins, diolefins, and polyenes each having more than five carbon atoms, and having no aromatic rings; and

(c) at least one member selected from the group consisting of fatty acid-containing materials and rosin acid-containing materials.

4,433,101

BLENDS OF VINYL HALIDE-POLYOLEFIN GRAFT COPOLYMERS AND ABS POLYMERS

William H. Gibby, Jr., Edgewater Park, N.J., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 181,564, Aug. 27, 1980, abandoned. This application Apr. 1, 1981, Ser. No. 250,957

Int. Cl.³ C08L *51/00*

U.S. Cl. 525—70 **21 Claims**

1. A moldable thermoplastic polymer composition consisting essentially of a blend of:

(a) a vinyl halide-hydrocarbon polyolefin graft copolymer consisting essentially of the product of bulk liquid phase polymerization of vinyl halide monomer alone or in combination with up to 50% by weight based on the total weight of monomer of another ethylenically unsaturated monomer copolymerizable therewith, in the presence of a free radical initiator compound for said polymerization, and about 0.05% to about 20% by weight, based upon said vinyl halide monomer, of a hydrocarbon olefin trunk polymer, and

(b) an ABS polymer comprising

(1) a mixture of a copolymer of acrylonitrile and a component selected from a group consisting of styrene, alpha methyl styrene, beta methyl styrene and mixtures thereof, with a minor amount of a copolymer of acrylonitrile and 1,3-butadine, or

(2) a mixture of a copolymer of acrylonitrile and said component with a minor amount of a graft of a copolymer of acrylonitrile and said component onto poly-1,3-butadiene.

4,433,102

THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Juergen Hambrecht, Heidelberg, and Rudolf Stephan, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,208

Claims priority, application Fed. Rep. of Germany 3129378

Int. Cl.³ C08L *51/00*

U.S. Cl. 525—75 **2 Claims**

1. A thermoplastic molding material containing

(A) 50–90% by weight, based on A+B, of a hard component comprising one or more copolymers of styrene or α-methylstyrene, or a mixture thereof, with acrylonitrile, these copolymers containing from 20 to 40% by weight of acrylonitrile as copolymerized units, and

(B) 50–10% by weight, based on A+B, of one or more graft copolymers comprising

(B_1) 40–80% by weight, based on (B), of a crosslinked acrylate polymer with a mean particle size of from 0.85 to 20 μm (d_{50} value of the cumulative mass distribution) and with a glass transition temperature Tg below 0° C., onto which

(B_2) 20–60% by weight, based on (B), of a mixture of styrene and acrylonitrile in a weight ratio of from 88:12 to 65:35 is grafted,

the grafting base (B_1) having been prepared by carrying out the polymerization in the presence of crosslinking monomers, water, water insoluble initiators, emulsifier of from 0.1 to 3% by weight, based on the monomer(s), and an aliphatic alcohol of 10 to 30 carbon atoms, wherein prior to the polymerization, a mixture of water, the emulsifier and the long-chain alcohol is prepared by stirring for from 5 to 30 minutes at above the melting point of the alcohols.

4,433,103
IMPACT-RESISTANT METHACRYLIC RESIN COMPOSITION

Kazumasa Kamata, Hiroshima, and Masamitsu Tateyama, Yamaguchi, both of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,511
Int. Cl.³ C08L 51/00, 33/12; C08F 265/06
U.S. Cl. 525—81 **27 Claims**

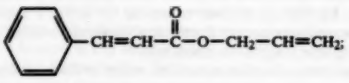
1. An impact-resistant methacrylic resin composition comprising a multilayer structure methacrylic resin composition [II] obtained by the following sequential four polymerization stages (i) through (iv):

(i) the first stage of forming 5 to 50 parts by weight of a hard crosslinked resin (A) containing at least 80% by weight of methyl methacrylate units;

(ii) the second stage of obtaining 100 parts by weight of a multilayer structure acrylic elastomer [I] by forming on the periphery of said hard crosslinked resin (A) 95 to 50 parts by weight of a layer of a crosslinked acrylic acid ester copolymer (B) by polymerizing a monomer mixture comprising 69.9 to 89.9% by weight of at least one alkyl acrylate having 1 to 8 carbon atoms in the alkyl group, 10 to 30% by weight of styrene or a mixture of styrene and a derivative thereof and 0.1 to 10% by weight of at least one compound selected from the group consisting of a compound of the formula:

(1)

and a compound of the formula:



(2)

(iii) the third stage of forming on the periphery of said elastomer [I] 5 to 100 parts by weight of a layer of a hard crosslinked resin (C) by polymerizing a crosslinkable monomer mixture comprising 80 to 99.9% by weight of methyl methacrylate, 0 to 19.9% by weight of at least one alkyl acrylate having 1 to 8 carbon atoms in the alkyl group, 0 to 10% by weight of other copolymerizable vinyl monomer and 0.1 to 10% by weight of a copolymerizable polyfunctional monomer having at least two carbon-to-carbon double bonds in the molecule; and

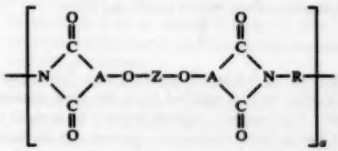
(iv) the fourth stage of forming on the periphery of said resin (C) 5 to 1000 parts by weight of a layer of a hard non-crosslinked resin (D) by polymerizing a non-crosslinkable monomer or non-crosslinkable monomer mixture comprising 80 to 100% by weight of methyl methacrylate, 0 to 20% by weight of at least one alkyl acrylate having 1 to 8 carbon atoms in the alkyl group and 0 to 10% by weight of other copolymerizable vinyl monomer, the resin (D)/resin (C) weight ratio being in the range of from 0.5 to 200.

4,433,104
POLYETHERIMIDE-FLUORINATED POLYOLEFIN BLENDS

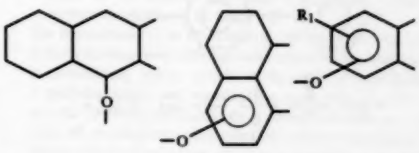
Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 18, 1982, Ser. No. 359,260
Int. Cl.³ C08L 29/08
U.S. Cl. 525—180 **9 Claims**

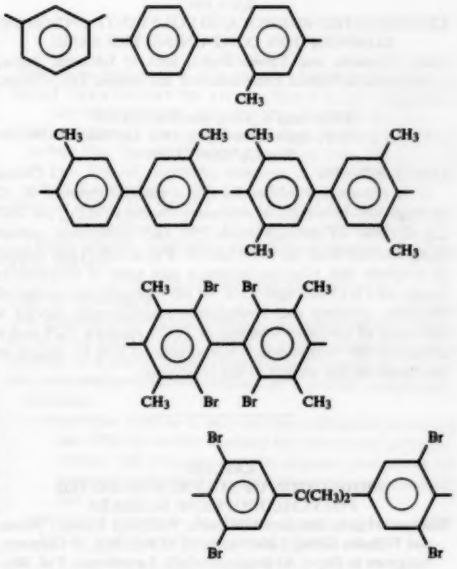
1. A composition comprising a blend of (a) a fluorinated polyolefin or copolymer thereof and (b) a polyetherimide which has the formula:



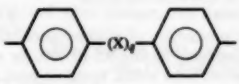
where a represents a whole number in excess of 1, the group —O—A< is selected from:



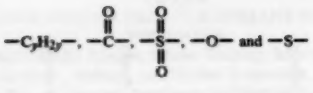
R′ being hydrogen, lower alkyl or lower alkoxy, Z is a member of the class consisting of (1)



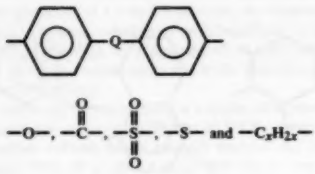
and (2) divalent organic radicals of the general formula:



where X is a member selected from the class consisting of divalent radicals of the formulas,



where q is 0 or 1, y is a whole number from 1 to 4, and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2\text{-}8)}$ alkylene terminated polydiorganosiloxane, and (3) divalent radicals included by the formula



where x is a whole number from 1 to 5 inclusive.

4,433,105

CHLORINATED RUBBER AND POLYVINYL CHLORIDE COMPOSITION CONTAINING THE SAME

Akira Matsuda, and Tetsuo Tojyo, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 4, 1981, Ser. No. 289,821
Claims priority, application Japan, Oct. 16, 1980, 55-145009
Int. Cl.³ C08F *8/20*
U.S. Cl. 525—211 12 Claims

1. A chlorinated rubber having a chlorine content of 10 through 50% by weight of a Mooney viscosity (ML_{1+4} at 100° C.) of about 20 through about 150, said chlorinated rubber being derived from the chlorination of (i) a copolymer rubber of ethylene and 1-butene having a mol ratio of ethylene/1-butene of 87/13 through 95/5 or (ii) a copolymer rubber of ethylene, 1-butene and 5-ethylidene-2-norboronese having a mol ratio of ethylene/1-butene of 87/13 through 95/5 and a content of the 5-ethylidene-2-norbornene of 20% by weight or less based on the weight of the copolymer.

4,433,106

PRODUCTION OF SULPHUR-MODIFIED POLYCHLOROPRENE RUBBERS

Rüdiger Musch, Bergisch-Gladbach; Wolfgang Konter, Neuss, and Wilhelm Göbel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,198
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143525
Int. Cl.³ C08L *11/00, 27/22*
U.S. Cl. 525—215 5 Claims

1. A process for the production of sulphur-modified polychloroprene rubber comprising mixing 0.5 to 40% by weight of styrene-butadiene-rubber latex solids, based on total solids, with a polychloroprene latex containing from 0.3 to 0.7% by weight of sulphur based on chloroprene, followed by peptization, coagulation, filtration and drying.

4,433,107

POLYISOPRENE RUBBER COMPOSITIONS

Yasumasa Takeuchi; Mitsuhiko Sakakibara; Nobuo Tagata, all of Yokkaichi; Masaki Ogawa, Sayama; Yasushi Hirata, Higashimurayama, and Shigeru Tomihira, Kodaira, all of Japan, assignors to Bridgestone Tire Co., Ltd.

Filed Aug. 3, 1982, Ser. No. 404,750
Claims priority, application Japan, Aug. 19, 1981, 56-128779
Int. Cl.³ C08L *9/00*
U.S. Cl. 525—232 7 Claims

1. A rubber composition comprising:
(a) not less than 20 parts by weight of polyisoprene having a melting point of not less than 10° C., a cis-1,4 bond content of not less than 88% and a tetrahydrofuran insoluble matter content of not more than 5% by weight; and
(b) the balance thereof of at least one other rubber.

4,433,108

PREPARATION OF STYRENE SUSPENSION POLYMERS

Hans G. Keppler, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,271
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125446
Int. Cl.³ C08F *2/18*
U.S. Cl. 525—255 6 Claims

1. A suspension polymerization process for the preparation of polymeric beads of homopolymers of styrene or styrene copolymers which consist predominantly of styrene, wherein styrene polymers from previous suspension polymerization batches are used along with fresh styrene monomer, which process comprises:
(a) dissolving styrene polymers from previous polymerization batches in styrene monomer to form a monomer phase, said polymers containing sparingly soluble metal phosphate suspension stabilizers;
(b) dissolving phosphoric acid in water to form an aqueous phase;
(c) dispersing the monomer phase in the aqueous phase by stirring at a temperature of from 10° to 80° C. for from 15 to 120 minutes to transfer the metal phosphate suspension stabilizers to the aqueous phase of the dispersion whereby the metal phosphate is dissolved in the aqueous phase;
(d) adding to the dispersion a metal compound to form a sparingly soluble metal phosphate suspension stabilizer by precipitation; and
(e) heating the dispersion containing the precipitated metal phosphate to initiate the suspension polymerization process.

4,433,109

STYRENE-BUTADIENE BLOCK COPOLYMER

Yasumasa Takeuchi, Yokohama; Mitsuhiko Sakakibara, Yokkaichi; Fumio Tsutsumi, Yokkaichi; Akio Takashima, Yokkaichi, and Iwakazu Hattori, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,862
Claims priority, application Japan, Dec. 17, 1980, 55-178226; Dec. 26, 1980, 55-186194; Dec. 26, 1980, 55-186195
Int. Cl.³ C08F *297/04*
U.S. Cl. 525—314 8 Claims

1. A styrene-butadiene block copolymer having a Mooney viscosity (ML_{1+4}, 100° C.) of 10 to 150, a total vinyl content in the whole bound butadiene of 30 to 70% and a total bound styrene content of 10 to 40% by weight, which comprises a combination of (A) at least one styrene-butadiene random copolymer block having a bound styrene content of 10 to 50% by weight and a vinyl content of 25 to 50% in the butadiene portion, and (B) at least one styrene-butadiene random copolymer block having a bound styrene content of 1 to 30% by weight and a vinyl content of at least 60% in the butadiene

portion, the fraction of the block (A) being 10 to 90% by weight, a combination of (A') at least one styrene-butadiene random copolymer block having a bound styrene content of 20 to 50% by weight and a vinyl content of 40 to 75% in the butadiene portion, and (B') at least one polymer block having a bound styrene content of not more than 10% by weight and a vinyl content of more than 20% but not more than 50% in the butadiene portion, the fraction of the block (A') being 10 to 90% by weight, or a combination of (A'') at least one styrene-butadiene random copolymer block having a bound styrene content of 10 to 50% by weight and a vinyl content of 10 to 50% in the butadiene portion, (B'') at least one styrene-butadiene random copolymer block having a bound styrene content of 1 to 30% by weight and a vinyl content of at least 60% in the butadiene portion, and (C) at least one polybutadiene block having a vinyl content of 10 to 50%, each of the blocks (A''), (B'') and (C) being contained in a proportion of at least 10% by weight.

4,433,110

PROCESS FOR PRODUCING PROPYLENE BLOCK COPOLYMERS

Kazuo Baba; Shyozo Kawamata, both of Chiba; Yoshiharu Fukui, Ehime; Seiichiro Ima, Ehime, and Tatsuya Miyatake, Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 17, 1981, Ser. No. 255,005

Claims priority, application Japan, Apr. 21, 1980, 55-53450; May 26, 1980, 55-70451

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—323 **5 Claims**

1. A propylene block copolymer produced by polymerizing propylene, ethylene and 1-butene in two stages with a Ziegler-Natta catalyst by a process which comprises (A) supplying propylene and ethylene in the first stage and propylene and said 1-butene in the second stage, or (B) supplying propylene and said 1-butene in the first stage and propylene and ethylene in the second stage, to the polymerization system, wherein the amounts of propylene and ethylene supplied in the first stage of (A) or in the second stage of (B) are 90 to 99 wt% and 10 to 1 wt% based on the total amount of propylene and ethylene supplied in the first stage of (A) or in the second stage of (B), respectively, the amounts of propylene and said 1-butene supplied in the second stage of (A) or in the first stage of (B) are 60 to 98 wt% and 40 to 2 wt% based on the total amount of propylene and said 1-butene supplied in the second stage of (A) or in the first stage of (B), respectively, and the amounts of copolymers formed in the first and second stages are 20 to 90 wt% and 80 to 10 wt% based on the final block copolymer, respectively.

4,433,111

FLUORINE-CONTAINING HYDROGEL-FORMING POLYMERIC MATERIALS

Brian J. Tighe, Birmingham, and Howard J. Gee, Derbyshire, both of England, assignors to Kelvin Lenses Limited, Manchester, England

Filed Oct. 8, 1981, Ser. No. 309,581

Claims priority, application United Kingdom, Oct. 14, 1980, 8033137; Oct. 14, 1980, 8033061

Int. Cl.³ C08F *214/18*; G02C *7/04*

U.S. Cl. 525—326.2 **15 Claims**

1. A crosslinked, fluorine-containing polymeric material suitable for use in biomedical applications, containing units derived either by simultaneous copolymerisation and crosslinking or by copolymerisation and subsequent cross-linking of the following monomers:

(1) 20 to 40 mole % of an amide of acrylic or methacrylic acid;

(2) 25 to 55 mole % of an N-vinyl lactam of the N-vinyl pyrrolidone type;

(3) 5 to 20 mole % of a hydroxyalkyl ester of acrylic or methacrylic acid;

(4) 1 to 10 mole % of acrylic or methacrylic acid; and (5) at least about 5 up to about 10 mole % of a hydrophobic monomer component comprising two monomer types (a) and (b) as follows:

(a) a fluorine-containing olefine, or fluorine-containing unsaturated alcohol, unsaturated carboxylic acid or ester or a non-fluorine-containing unsaturated alcohol which, after copolymerisation of monomers (1) to (5), is esterified using a fluorine-containing aliphatic carboxylic acid or derivative thereof, and

(b) a non-fluorine-containing polymerisable hydrophobic vinyl monomer which is at least one monomer selected from the group consisting of vinyl aromatic hydrocarbons of the styrene type and hydrophobic esters of acrylic or methacrylic acid;

the monomers (1) to (5) totalling 100 mole %, the crosslinking having been effected with crosslinking amounts of a crosslinking agent, which, in the case of simultaneous copolymerisation and crosslinking, is an ester of a diol and acrylic or methacrylic acid or is divinylbenzene, or, in the case of crosslinking subsequent to copolymerisation, is a latent crosslinking agent which is a diamide of an unsaturated aliphatic carboxylic acid, an anhydride of an aliphatic or aromatic carboxylic acid, a diepoxide or dicumyl peroxide, the crosslinking agent having been used in an amount of up to 5 weight % based on the total weight of monomers (1) to (5).

4,433,112

PREPARATION OF A POLYVINYLPYRROLIDONE BY HEAT TREATMENT OF AN AQUEOUS SOLUTION OF A CONVENTIONAL POLYVINYLPYRROLIDONE

Ferdinand Straub, Hockenheim; Heinrich Hartmann, Limburgerhof; Paul Naegele, Neuhofen, and Karl Seib, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 197,022, Oct. 16, 1980, Pat. No. 4,330,451. This application Mar. 15, 1982, Ser. No. 358,513

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1979, 2942657

Int. Cl.³ C08F *8/00, 126/10*

U.S. Cl. 525—326.9 **3 Claims**

1. Polyvinylpyrrolidone which is characterized by a viscosity of from 1,000 to 2,000 mPa.S at room temperature when admixed in water at a concentration of 2 percent by weight; said polyvinylpyrrolidone obtained by a process comprising:

admixing

an aqueous solution of polyvinylpyrrolidone of between 5 and 30% by weight obtained by free-radical polymerization, with a water-insoluble organic peroxide of between 0.5 and 5% by weight of polyvinylpyrrolidone; and

heating said mixture in the absence of oxygen at between 20° to 250° C. for a sufficient period of time.

4,433,113

IONOMERS AS ANTISTATIC AGENTS

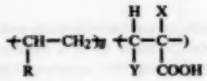
Fred E. Woodward, 200 Churchill Rd., West Palm Beach, Fla. 33405, and Alice Hudson, 728 Kalmia Dr., Lake Park, Fla. 33403

Filed Aug. 10, 1981, Ser. No. 291,403

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—327.5 **8 Claims**

1. An ionomer composition comprising the water insoluble conductive salts of copolyers of alpha olefins and dicarboxylic acids of 4 and 5 carbon atoms of the general structure

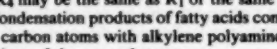


in which at least one-tenth of the —COOH groups exist as the ionized anion —COO^- with a quaternary ammonium cation; the mole ratio of olefins (a) to dicarboxylic monomer is such that the combined weight of olefin for each dicarboxylic monomer unit is from at least 196 up to about 600; R is H or a hydrocarbon of 1 to 22 carbon atoms; and Y is H, and X is $—CH_2COOH$; or Y is —COOH, and X is H or CH_3; the quaternary ammonium cation is

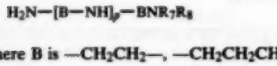
(1) $R_1R_2R_3R_4N^+$ in which R_1 is alkyl or alkenyl containing about 12 to 22 carbon atoms and may be interrupted by O, S,

or phenyl, R_2 and R_3 are methyl, ethyl, propyl, hydroxyethyl, hydroxypropyl; or benzyl, and may be the same or different, and R_4 may be the same as R_1 or the same as R_2 or R_3; or

(2) Condensation products of fatty acids containing about 12 to 22 carbon atoms with alkylene polyamines or hydroxyalkyl amines of the general structure:



where B is $—CH_2CH_2—$, $—CH_2CH_2CH_2—$,



R_7 and R_8 are hydrogen methyl, ethyl, benzyl or hydroxy alkyl, and P is zero, 1 or 2; in which the amino-amide or imidazoline is quaternized with a methyl halide, or dimethyl or diethylsulfate.

4,433,114

DIENE RUBBER AND METHOD AND COMPOSITION FOR RUBBER TREATMENT

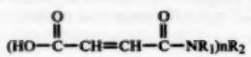
Aubert Y. Coran, and Chester D. Trivette, Jr., both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 322,142, Nov. 17, 1981, abandoned. This application May 20, 1982, Ser. No. 380,185

Int. Cl.³ C08C *19/22, 19/20*

U.S. Cl. 525—332.6 **62 Claims**

1. A composition comprising diene rubber treated, in the presence of a modification promoting amount of (A) sulfur or an organic sulfur compound capable of generating thiyl radicals, by (B) a compound of the formula

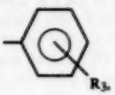


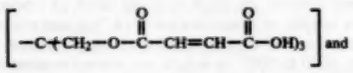
n being an integer of 1–3, wherein R_1 is hydrogen or alkyl of 1–10 carbon atoms and, if n=1, R_2 is selected from

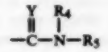
hydrogen,

alkyl of 1–10 carbon atoms, optionally forming a heterocyclic moiety with the N atom of the formula and R_1, either with or without an added N or O atom,

-continued



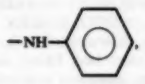




wherein Y is an oxygen or sulfur atom, x is an integer of 1–12, R_3 is:

hydrogen, —COOH,

alkoxy of 1–5 carbon atoms or



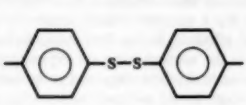
R_4 and R_5 are the same or different selected from:

hydrogen,

phenyl and

alkyl of 1–10 carbon atoms;

if n=2, R_2 is selected from phenylene, divalent aliphatic hydrocarbon radicals of 2–20 carbon atoms and



and if n=3, R_2 is s-triazinyl or a trivalent aliphatic hydrocarbon of 2–20 carbon atoms, said composition having been treated at a temperature of from 160° to 210° C. for a long enough time to impart to the compositin improved green strength, tack or non-black filler interaction capability.

4,433,115

PHOSPHORUS-CONTAINING IMIDE RESINS

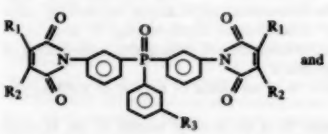
Indra K. Varma, New Delhi, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 288,267, Jul. 30, 1981, Pat. No. 4,395,557. This application Jul. 11, 1983, Ser. No. 512,795

Int. Cl.³ B32B *7/00;* **C07D** *207/26, 209/34;* **C08F** *283/00*

U.S. Cl. 525—417 **20 Claims**

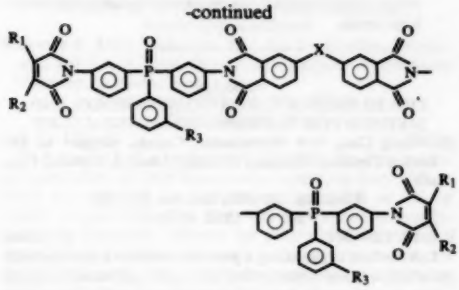
1. A fiber-reinforced imide polymer composite comprising reinforcing fiber in a cured polymer of an imide have a structure selected from



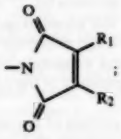
I

and

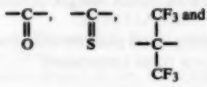
-continued



wherein R_1 and R_2 are selected from the group consisting of chlorine, methyl and hydrogen; R_3 is the amino group or an imide group



X is a linking entity selected from the group consisting of a valence bond, —O—, —S—, $-C_nH_{2n}-$ wherein n is 1, 2, or 3,



4,433,116

PROCESS FOR INCREASING THE RELATIVE VISCOSITY OF POLYCAPROLACTAM WITH PHOSPHITE COMPOUND

Theodore Largman, Morristown, and Shaul M. Aharoni, Morris Plains, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 280,563, Jul. 6, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,210

Int. Cl.³ C08G *69/48*

U.S. Cl. 525—420 **16 Claims**

1. A process for decreasing the melt index and increasing the viscosity of polymers of caprolactam that comprises:

(a) forming a mixture of one or more of said polymers and an effective amount of one or more phosphite compounds of the formula:

wherein:

R_1 is alkyl or haloalkyl having from 2 to 12 carbon atoms or phenyl either unsubstituted or substituted with one or more halo or alkyl substituents having 1 to 12 carbon atoms;

R_2 and R_3 are individually R_1, hydrogen or a metal cation; and

(b) heating said mixture for a period of time between about 1 minute and about 15 minutes at a temperature between about the melting point of said polymer and about 320° C. to produce a polymer having increased relative viscosity; wherein said relative viscosity of said polymer of caprolactam is increased by at least about 20%.

4,433,117

COPOLYESTERAMIDE AND PRODUCTION OF THE SAME

Motowo Takayanagi, Fukuoka, and Yoshifumi Murata, Kurashiki, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

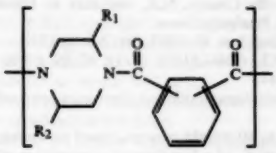
Filed Mar. 8, 1983, Ser. No. 473,226

Claims priority, application Japan, Mar. 23, 1982, 57-46671; Mar. 23, 1982, 57-46672; Jul. 14, 1982, 57-123703

Int. Cl.³ C08F *283/04*; C08G *69/48, 73/16*

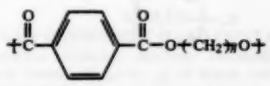
U.S. Cl. 525—425 **25 Claims**

1. A random block copolyesteramide comprising 0.05 to 20 wt% of polyamide blocks composed of amide units represented by the formula (I)



(I)

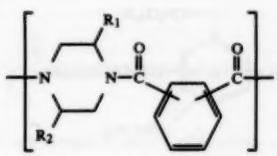
(where R_1 and R_2 are hydrogen or a methyl group) and 99.95 to 80 wt% of polyester blocks composed of ester units represented by the formula (II)



(II)

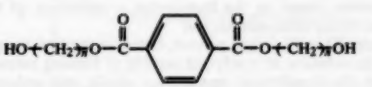
(where n is an integer of 2 to 4), said copolyesteramide having an intrinsic viscosity higher than 0.5, and the average number of the consecutive repeating amide units in said polyamide blocks being 2 to 40.

11. A process for producing a copolyesteramide which comprises dissolving a polyamide oligomer having the repeating unit represented by the formula (I) and having an average degree of polymerization of 2 to 40,



(I)

(where R_1 and R_2 are hydrogen or a methyl group) in a polyester monomer or a prepolymer thereof represented by the formula (III),



(III)

(where n is an integer of 2 to 4) and subsequently performing a polycondensation reaction.

4,433,118
POLY (P- AND M-METHYLENEBENZOATE) BLENDS WITH POLYARYLATES

Michael M. Schwartz, Aurora; Jack R. Knox, Naperville, and Edward E. Paschke, Wheaton, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 301,362, Sep. 11, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,854

Int. Cl.³ C08L *67/02, 67/00*

U.S. Cl. 525—437 **13 Claims**

1. A composition comprising a blend of (a) a polyarylate derived from a dihydric phenol and at least one aromatic dicarboxylic acid, ester, or acid chloride, and (b) a poly(methylenebenzoate) wherein said polyarylate is present in an amount of from about 1 to 99 weight percent and said poly(methylenebenzoate) is present in an amount of from about 99 to 1 weight percent.

4,433,119
LIQUID THERMOSETTING COMPOSITIONS CONTAINING HEMIFORMALS OF PHENOL

George L. Brode, and Sui-Wu Chow, both of Bridgewater Township, Somerville County, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

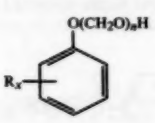
Filed Jan. 19, 1982, Ser. No. 340,720

Int. Cl.³ C08G *61/10, 61/14, 67/06, 69/00*

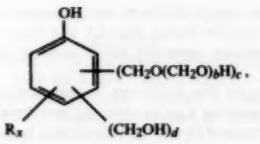
U.S. Cl. 525—442 **11 Claims**

1. A liquid solution curable to a thermoset resin which comprises;

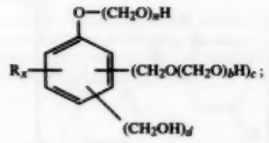
(I) From 40 to 80 weight percent, based on the total weight of the solution, of a hemiformal composition of a phenol having any one of the formulas:



or



or



wherein n is a positive number of greater than 1, b is 1 to about 5, and c is 1 to about 3, d is 0 to about 2, the sum of c and d is at least 1 and no greater than 3, the sum of c, d and x is at least 1 and no greater than 5, x is 0 to 3, R is a monovalent radical wherein x=0 for at least 50 weight peercent, based on the hemiformal composition, of the hemiformal composition; and

(II) from 20 to 60 weight percent, based on the total weight of the solution, of a polymer capable of forming solution with the hemiformal composition of (I), said polymer being from the group; phenol-formaldehyde resoles, phenol formaldehyde novolacs, aromatic polyesters, aromatic polycarbonates, unsaturated polyesters, aromatic polyethers, urea-formaldehyde resins and melamine-formaldehyde resins.

4,433,120
LIQUID PHENOLIC RESIN COMPOSITION AND METHOD FOR WAFERBOARD MANUFACTURE

Shui-Tung Chiu, New Westminster, Canada, assignor to The Borden Chemical Company (Canada) Limited, Toronto, Canada

Filed Sep. 30, 1981, Ser. No. 307,180

Int. Cl.³ C08L *61/10*

U.S. Cl. 525—501 **15 Claims**

1. A method of preparing a pre-cure resistant liquid phenolic resin binder composition having a viscosity and surface tension which is sufficiently low to allow spray application as fine droplets to waferboard comprising the steps of:

(a) reacting phenol and formaldehyde in a formaldehyde to phenol molar ratio of 1:1 to 3:1 in a first stage in the presence of an alkaline catalyst at a temperature which is allowed to rise to between 80° C. and reflux to produce a highly-condensed and crosslinkage phenol-formaldehyde resin having an average molecular weight in the range of about 2000–6000 and a viscosity of 100–450 cps at 25° C.

(b) reducing the temperature of the resulting resin to 60°–70° C.,

(c) adding a second portion of phenol and formaldehyde in a phenol to formaldehyde mol ratio of 1.5:1 to 3:1 and alkaline catalyst to the resin and cooking at 45°–70° C. until the formaldehyde is reacted to a free formaldehyde content of 0–4% to produce a non-resinous phenol-formaldehyde condensate comprising methylated phenols having an average molecular weight of about 200–300; and

(d) cooling the resulting liquid phenolic resin composition to a temperature below room temperature.

4,433,121
POLYMERIZATION PROCESS

Yasunori Kabu, Ichihara; Masayoshi Yasunaka; Yoshinori Morita, both of Iwakuni, and Masanori Motowoka, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,472

Claims priority, application Japan, Jul. 7, 1981, 56-105137

Int. Cl.³ C08F *2/04*

U.S. Cl. 526—68 **7 Claims**

1. In a process for polymerizing a monomer capable of being formed, upon polymerization, into a solution having an upper cloud point of the corresponding polymer in a reaction medium being liquid under the reaction conditions, the polymerization being carried out under such conditions that the resulting polymer dissolves in the reaction medium; the improvement wherein

(i) the polymerization is carried out in a polymerization zone under a pressure of from atmosphere pressure to about 150 kg/cm^2-G and at a temperature above the upper cloud point of said polymer solution and under conditions which enable the polymer solution to be separated into two phases,

(ii) the polymerization is carried out under stirring conditions which maintain the two phases under said phase-separating conditions in a dispersed and mixed state, and

(iii) the resulting polymer solution is sent to a separating zone located independently of said polymerization zone, thereby separating it into two phases in the separating zone at a temperature above the upper cloud point, and thereafter, the polymer-rich liquid phase as a lower layer is recovered while the polymer-lean liquid phase as an upper layer is recycled to the polymerization zone.

4,433,122
STOPPING/RESTARTING FREE RADICAL POLYMERIZATIONS

Raymond S. Knorr, Pensacola, Fla.; Joe D. Chandler, Decatur, Ala., and Loi N. Tran, Harvey, La., assignors to Monsanto Company, St. Louis, Mo.

Filed May 3, 1982, Ser. No. 373,822
Int. Cl.³ C08F 6/02, 20/44
U.S. Cl. 526—83 **14 Claims**

1. A method of stopping and restarting the free radical polymerization of vinyl monomer(s) comprising from 35% to 100% by weight of acrylonitrile and from 65% to 0% by weight, respectively, of at least one vinyl monomer copolymerizable therewith, wherein the polymerization utilizes a redox catalyst system comprising a promoter consisting of multivalent metal ions, a reducing agent and an oxidizing agent, said method comprising the steps of:

(a) stopping the polymerization by adding thereto sufficient chelating agent to chelate said multivalent metal ions,

(b) adding said monomer(s) to the polymerization in an amount sufficient to ensure that monomer radicals present at the time metal ions are chelated polymerize to form polymer having a specific viscosity corresponding substantially to that of polymer formed before the chelating agent was added and

(c) subsequently restarting the polymerization by adding thereto a multivalent metal compound or multivalent metal in an amount sufficient to provide a concentration of promoter corresponding substantially to the concentration of promoter present before the chelating agent was added.

4,433,123
POLYMERIZATION PROCESS FOR DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 7,088, Jan. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 953,144, Oct. 20, 1978, abandoned. This application May 12, 1981, Ser. No. 262,870
Int. Cl.³ C08F 4/64, 10/00
U.S. Cl. 526—139 **14 Claims**

1. A method for the production of ultrahigh molecular weight non-crystalline hydrocarbon soluble polymers comprising:

(a) preparing under an inert atmosphere a catalyst comprising

(1) titanium trichloride,

(2) a co-catalyst of the formula AlR_nX_{3-n} where R is a hydrocarbon radical containing from 1 to 20 carbon atoms, X is hydrogen or halogen, and n is 2 or 3, a phosphorus compound of the formula $PR_1R_2R_3$, wherein R_1, R_2, and R_3 are, independently, aryl, alkyl, aralkyl, or alkaryl, each containing from 1 to 12 carbon atoms and placing the catalyst in contact with

(b) C_2 to C_{30} monoolefinic hydrocarbons, said contacting occurring at temperatures of from about −10° C. to about 40° C. to polymerize said olefins, then

(c) ceasing polymerization at a polymer content level of 20% by weight or less based on the total reaction mixture.

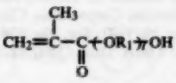
4,433,124
ADHESIVE COMPOSITIONS

Takanori Okamoto; Hisakazu Mori, both of Kagawa, and Hideaki Matsuda, Kawaga, all of Japan, assignors to Okura Kogyo Kabushiki Haisha, Japan

Filed Nov. 23, 1981, Ser. No. 323,922
Claims priority, application Japan, Dec. 13, 1980, 55-175245
Int. Cl.³ C08F 220/28, 230/02
U.S. Cl. 526—277 **9 Claims**

1. A one-part adhesive composition which comprises

(i) 100 parts by weight of a mixture comprising 90 to 20% by weight of a hydroxyl-containing polymerizable methacrylate represented by the following general formula (1),

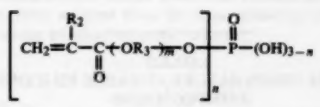


(1)

wherein R_1 is an alkylene group having 2 to 4 carbon atoms and l stands for an integer of from 1 to 8, and 10 to 80% by weight of a polymerizable methacrylate having 2 or more methacrylic groups, in admixture with

(ii) the following components (a) through (d),

(a) 0.02 to 0.5 part by weight of a polymerizable phosphate represented by the following general formula (2),



(2)

wherein R_2 is hydrogen or methyl group, R_3 is an alkylene or halogenoalkylene group having 2 to 4 carbon atoms, m stands for an integer of from 1 to 8 and n stands for an integer of 1 or 2,

(b) 0.5 to 5 parts by weight of 1,2,3,4-tetrahydroquinoline salt of o-benzoic sulfimide,

(c) 0.005 to 1.0 part by weight of an organic hydroperoxide, and

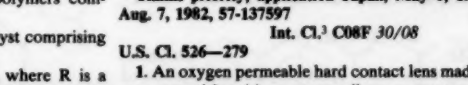
(d) 0.2 to 2.5 parts by weight of water.

4,433,125
OXYGEN PERMEABLE HARD CONTACT LENS

Shoji Ichinohe, Annaka; Kouzou Takahashi, Aichi, and Yasuharu Tanaka, Nagoya, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd. and Toyo Contact Lens Co., Ltd., both of, Japan

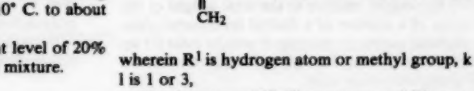
Filed Jan. 21, 1983, Ser. No. 459,981
Claims priority, application Japan, May 8, 1982, 57-77133; Aug. 7, 1982, 57-137597
Int. Cl.³ C08F 30/08
U.S. Cl. 526—279 **7 Claims**

1. An oxygen permeable hard contact lens made of a copolymer comprising (a) an organosilane or organosiloxane compound having in one molecule at least one group of the general formula (I):



(I)

wherein R^1 is hydrogen atom or methyl group, k is 0 or 1, and l is 1 or 3,
and having at most 16 silicon atoms, and (b) a compound of the general formula (II):



(II)

wherein R^1 is as defined above, m is 0 or 1, n is 0 or an integer of 1 to 3, and R_f is a straight or branched fluoroalkyl group having 2 to 21 fluorine atoms.

4,433,126
MODIFIED PHENOL-FORMALDEHYDE RESIN AND THE PRODUCTION THEREOF

Oscar H. H. Hsu, and Milford C. Tassler, both of St. Charles, Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Dec. 28, 1981, Ser. No. 334,881
Int. Cl.³ C08H 5/04; C08G 83/00
U.S. Cl. 527—105 **5 Claims**

1. A method of forming a modified phenol-formaldehyde binding resin for ligno-cellulose fibers, comprising reacting a concentrated aqueous extract obtained from the steam digestion of wood chips with phenol and formaldehyde under alkaline conditions at a temperature not exceeding about 100° C. until a resin with a viscosity of at least about 35 cps (Brookfield) is produced, the mole ratio of phenolic compounds to formaldehyde being in the range from 1:2 to 1:3, the weight of concentrated aqueous extract being from 5% to 50% of the weight of the phenol, calculated on the dry weight of each material.

4,433,127
ROOM TEMPERATURE CURABLE SILICONE COMPOSITIONS

Iwakichi Sugiyama, Narashino; Kiyoshi Endo, Motono, and Yukihisa Takaoka, Ushiku, all of Japan, assignors to Matsumoto Seiyaku Kogyo Kabushiki Kaisha, Chiba, Japan

Filed Jun. 17, 1982, Ser. No. 389,465
Int. Cl.³ C08G 77/06
U.S. Cl. 528—17 **6 Claims**

1. A room temperature curable silicone composition comprising a silanol-terminated polyorganosiloxane compound selected from the group consisting of siloxane compounds having a hydroxy group bonded to a silicon atom and being capable of forming a two-dimensional network, a silyl isocyanate having three or more isocyanate groups directly bonded to a silicon atom and a Ti—O—P bond-containing organic compound.

4,433,128
EMBEDDING MASS BASED UPON FAST-REACTING POLYURETHANE CASTING RESIN

Gerhard Wick, Obernburg, Fed. Rep. of Germany, assignor to Akzo NV, Arnhem, Netherlands

Filed Nov. 22, 1982, Ser. No. 443,739
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147025
Int. Cl.³ C08G 18/18
U.S. Cl. 528—53 **20 Claims**

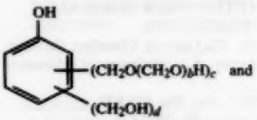
1. Embedding mass based upon polyurethanes produced from castor oil, comprising a polyurethane, which has been obtained through reaction of an aromatic polyisocyanate with a mixture of castor oil and trimethylolpropane to produce an NCO-group-displaying pre-adduct and polymerization of the pre-adduct with a polypropyleneglycol or a mixture of polypropyleneglycol and trimethylolpropane in the presence of catalyst, said embedding mass containing as catalyst about 0.005 up to 0.3% by weight, relative to the total weight of the polyurethane resin, of a mixture of a dialkyl tin dicarboxylate and a tertiary aliphatic mono- or diamine in weight ratio 1:1 up to 4:1, said employed polypropylene glycol being constructed of 25 up to 50 propylene oxide units.

4,433,129
HEMI-FORMALS OF METHYLOLATED PHENOLS

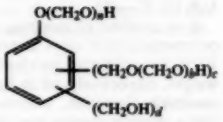
George L. Brode, and Sui-Wu Chow, both of Bridgewater Township, Somerville County, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 19, 1982, Ser. No. 340,790
Int. Cl.³ C08G 8/10
U.S. Cl. 528—154 **9 Claims**

1. A liquid composition of a hemiformal of methylolated phenol having at least one of the following structures:



and



wherein b is 1 to about 5, c is 1 to about 3, d is 0 to about 2, the sum of c and d is at least 1 and does not exceed 3, and n is greater than or equal to 1, said hemiformal being stable between about 35° C. and about 55° C. and curable to a phenolic resin in the presence of a phenol aldehyde resin curing catalyst.

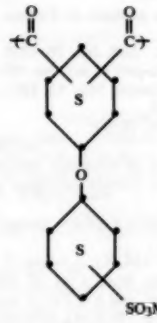
4,433,130
CYCLOALKYLSULFONATES, POLYMERS AND PROCESSES RELATING TO SAME

Susan E. Hartman; Michael E. Allen, and William E. Pascoe, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,238
Int. Cl.³ C08G 68/02
U.S. Cl. 528—173 **10 Claims**

1. A condensation polymer comprising:

(a) from 0.1 to 70 mole percent of recurring units having the formula:



wherein M is a monovalent cation selected from the group consisting of alkali metal and ammonium;

(b) 30 to 99.9 mole percent of recurring units derived from one or more additional polymerized copolymerizable polycarboxylic acids; and

(c) 100 mole percent of at least one polymerized copolymerizable diol, diamine or hydroxyamine.

4,433,131
COATING SOLUTION OF POLYETHERIMIDE MONOMERS

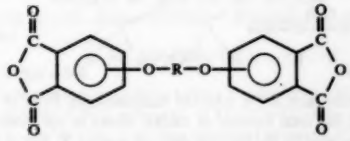
Donald A. Bolon, and Thomas B. Gorczyca, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,707
Int. Cl.³ C08G 73/10
U.S. Cl. 528—185 **19 Claims**

1. A monomeric coating solution comprising

(1) an organic residue selected from the group consisting of

acidic derivatives of aromatic bis(ether anhydride) and esterified derivatives of aromatic bis(ether anhydride) obtained from monofunctional alcohols, said bis(ether anhydride) having the formula:



(2) an organic diamine having the formula:

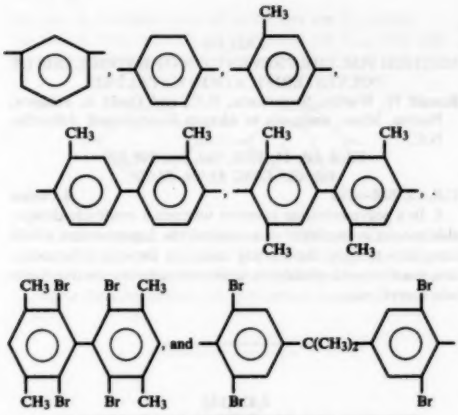
$H_2N-R'-HN_2$

(3) an organic triamine having the formula:

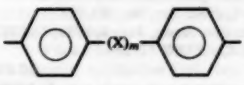
$R^2(NH_2)_3$

(4) water and

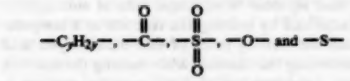
(5) a suitable organic solvent where R is a member selected from the class consisting of (A) divalent organic radicals having the following formulas:



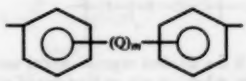
and (B) divalent organic radicals of the general formula: an (B) divalent organic radicals of the general formula:



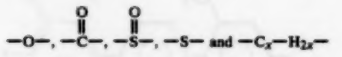
where m is 0 to 1 and X is a member selected from the class consisting of divalent radicals of the formulas,



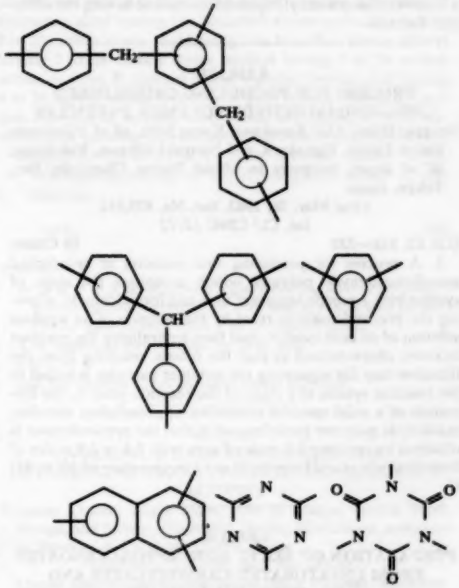
where y is an integer from 1 to 4, R^1 is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and haloginated derivatives thereof, (b) alkylene radicals having from 2 to about 20 carbon atoms, and cycloalkylene radicals having from 3 to about 30 carbon atoms, (c) from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and (d) divalent radicals of the general formula:



where m is as previously defined and Q is a member selected from the class consisting of:



where x is an integer from 1 to 5 inclusive and R^2 is a member selected from the class consisting of (a) the following trivalent aromatic radicals:



and (b) trivalent aliphatic radicals, or combinations thereof.

4,433,132

POLYESTERS CONTAINING BIS(TRIFLUOROMETHYL)BIPHENYLENE RADICALS

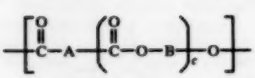
Howard G. Rogers, Weston, Mass.; Russell A. Gaudiana, Merrimack, N.H., and Richard A. Minns, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1982, Ser. No. 414,473

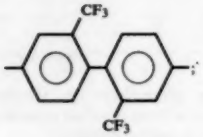
Int. Cl.³ C08G 63/06, 63/18, 63/68

U.S. Cl. 528—191 **14 Claims**

1. A polymer comprising recurring units of the formula



wherein each of A and B is a divalent organic radical and c is zero or one; and wherein, when c is one, at least one of said A and B divalent organic radicals is a 2,2'-bis(trifluoromethyl) biphenylene radical having the formula



and wherein, when c is zero, said divalent organic radical A is a 2,2-bis(trifluoromethyl)biphenylene radical having the aforesaid formula.

4,433,133

PROCESS FOR PRODUCING CROSSLINKED UREA-FORMALDEHYDE POLYMER PARTICLES

Naoyuki Ifuku; Akio Kurokawa; Kenzo Seita, all of Yokohama; Kaoru Usami, Kamakura, and Naoyuki Aikawa, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,811
Int. Cl.³ C08G 12/12
U.S. Cl. 528—232 **10 Claims**

1. A process for producing fine particles of crosslinked urea-formaldehyde polymer which comprises the steps of synthesizing a precondensate of urea and formaldehyde, allowing the precondensate to react by the addition of an aqueous solution of an acid catalyst, and then neutralizing the reaction mixture, characterized in that the filtrate resulting from the filtration step for separating the polymer particles is added to the reaction system at a stage of the reaction prior to the formation of a solid material consisting of crosslinked urea-formaldehyde polymer particles and in that the precondensate is obtained by reacting 1.0 mole of urea with 1.4 to 1.9 moles of formaldehyde at a pH of 6 to 10 and a temperature of 10° to 95° C.

4,433,134

PREPARATION OF ALKYL MERCAPTOALKANOATES FROM UNSATURATED CARBOXYLATES AND CO_2-CONTAMINATED H_2S

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 62,660, Aug. 1, 1979. This application Aug. 12, 1982, Ser. No. 407,415
Int. Cl.³ C08G 63/04, 63/34
U.S. Cl. 528—279 **27 Claims**

1. A method comprising:

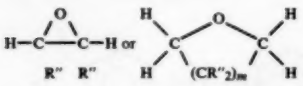
reacting carbon dioxide-containing hydrogen sulfide with an olefinically unsaturated carboxylate of the formula

$$CR_2{=}CR{-}CR_2{-}_pCO_2R'$$

wherein R' is an alkyl radical containing from 1 to 5 carbon atoms; each R is selected independently from hydrogen and R'; p is selected from 0, 1, 2 and 3; and the total number of carbon atoms in all the R groups does not exceed 15,

in the presence of a basic catalyst having an ionization constant of at least 2.0×10^{-5} at 25° C., to form a reaction product comprising mixed esters, and

reacting thus-obtained mixed esters in the presence of a transesterification catalyst with a poly(oxyalkylene)-polyol produced by reacting one or more epoxy-substituted hydrocarbons of the formula



wherein each R'' is selected independently from H and alkyl, the total number of carbon atoms in the molecule represented by the formula does not exceed 20, and m is an integer of from 1 to 10, with a polyol of the formula

$$Y(OH)_x$$

wherein Y is a hydrocarbon moiety having at least two carbon atoms and a valence equal to the value of x, and x is an integer of at least two.

25. The method of claim 1 in which the transesterification catalyst is $M(OR''')_4$, wherein R''' is an alkyl group having from 1 to 10 carbon atoms and M is titanium or zirconium.

4,433,135

METHOD FOR THE PREVENTION OF HYDROLYSIS OF POLYESTERIFICATION CATALYSTS

Ronald W. Worley, Swannanoa, N.C., and David A. Johnson, Norton, Mass., assignors to Akzona Incorporated, Asheville, N.C.

Filed Jul. 14, 1982, Ser. No. 398,029
Int. Cl.³ C08G 63/04, 63/32
U.S. Cl. 528—282 **8 Claims**

1. In a polymerization reaction wherein a readily hydrolyzable species is employed as a catalyst, the improvement which comprises treating the starting materials for said polymerization reaction with aluminum sulfate in order to remove moisture therefrom.

4,433,136

PROCESS FOR PREPARING POLYAMIDE IN UNIFORMLY FLUIDIZED STATE

Akira Miyamoto; Senzo Shimizu; Kazuo Yamamiya, and Masahiro Harada, all of Kanagawa, Japan, assignors to Mitsubishi Gas Chemical Company Inc., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,974
Claims priority, application Japan, Jun. 4, 1981, 56-85922
Int. Cl.³ C08G 69/28
U.S. Cl. 528—347 **10 Claims**

1. A process for preparing a polyamide which comprises effecting the polycondensation reaction of a reaction mixture comprising a diamine component containing at least 70 mole % of m-xylylene diamine and a dicarboxylic acid component containing at least 80 mole % of adipic acid at atmospheric pressure, characterized by starting the reaction at a temperature higher than the melting point of said dicarboxylic acid component; continuing the reaction while heating the reaction mixture at such a temperature that the reaction mixture is mantained in a uniformly-fluidized state; and further continuing the reaction, with the reaction mixture being maintained in a uniformly-fluidized state, by heating the reaction mixture at a temperature higher than the melting point of the resulting polyamide or lower than said melting point by an amount not exceeding 30° C. before conversion of said components to the polymer reaches 95%.

4,433,137

TRANSPARENT POLYAMIDE FROM BRANCHED CHAIN ARYLENE DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,118

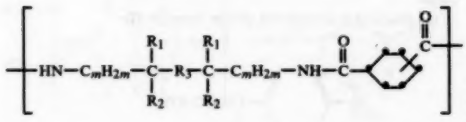
Claims priority, application United Kingdom, Jun. 19, 1981, 8119013

Int. Cl.³ C08G 69/26

U.S. Cl. 528—348 6 Claims

1. A transparent polyamide having a reduced specific viscosity of at least 0.3 dl/g, measured on a 0.5% solution in m-cresol at 25° C., and having recurring structural elements of formula I

(I)



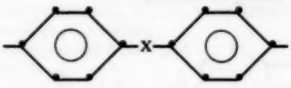
wherein

the two m independently of each other are an integer of from 4 to 16,

the two R_1 independently of each other are C_{1-3} alkyl,

the two R_2 independently of each other are C_{1-6} alkyl and

R_3 is 1,4-phenylene or



wherein

X is the direct bond, or X represents —CH_2—, —O—, —S— or —NH—, and whereby the carbonyl groups in the structural elements of formula I are linked to the benzene ring in the 1,3-position, 1,4- position or in mixture thereof.

4,433,138

PROCESS FOR THE PREPARATION OF POLYARYLENE SULPHIDES

Karsten Idel; Dieter Freitag; Ludwig Bottenbruch, all of Krefeld, and Otto Neuner, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,036

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120538

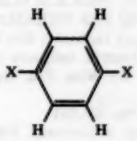
Int. Cl.³ C08G 75/14

U.S. Cl. 528—388 7 Claims

1. In the process for preparation of high molecular weight thermoplastic branched polyarylene sulphide having a melt viscosity between 0.5×10^3 and 5×10^5 Pa.s by reacting halogenoaromatic compounds with alkali metal sulphides,

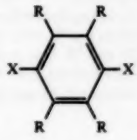
the improvement comprises reacting components (a), (b) and (c) in a lactam without further metal salt catalyst with a molar ratio of (a):(c) in the range of 0.85:1 to 1.15:1 and a molar ratio of (c): solvent in the range of 1:2 to 1:15, for a time of up to 10 hours at a temperature of from 160° C. to 300° C., and in the presence of from 2 to 100 mole percent, relative to (c), of an N,N-dialkylcarboxamide;

wherein component (a) is dihalogenobenzene with 50 to 100 mole percent of the formula



(I)

and 0 to 50 mole percent of the formula



(II)

wherein X is fluoro, chloro, bromo or iodo, and R is the same or different and each is selected from the group consisting of hydrogen, alkyl having 1 to 20 carbon atoms cycloalkyl having 5 to 20 carbon atoms, aryl having 6 to 24 carbon atoms, alkaryl having 7 to 24 carbon atoms, aralkyl having 7 to 24 carbon atoms, and two R moieties linked together forming aryl having 6 to 24 carbon atoms or a heterocyclic moiety having an oxygen, nitrogen or sulphur hetero-atom and having 6 to 24 carbon atoms; with the proviso that at least one R is not hydrogen;

component (b) is 0.1 to 2.4 mole percent, relative to the dihalogenobenzene, of a polyhalogenoaromatic of the formula

$$ArX_n \qquad \text{(III)}$$

wherein

Ar is aryl or a heterocyclic moiety having an oxygen, nitrogen or sulphur heteroatom with said aryl and said heterocyclic each having from 6 to 24 carbon atoms;

X is fluoro, chloro, bromo or iodo; and

n is 3 or 4;

and component (c) is an alkali metal sulphide.

4,433,139

N-ACETYL-β-D-GLUCOSAMNIDES FOR DETERMINING N-ACETYL-β-D-GLUCOSAMINIDASE ACTIVITY

Yasunao Ogawa; Akira Noto, both of Osaka; Sachio Mori, Hyogo, and Mitsuru Yoshioka, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

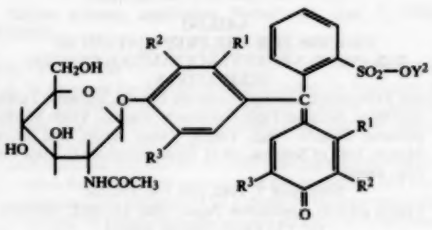
Filed Mar. 11, 1982, Ser. No. 357,317

Claims priority, application Japan, Mar. 17, 1981, 56-39104

Int. Cl.³ C07H 5/04, 5/20

U.S. Cl. 536—17.2 1 Claim

1. An N-acetyl-β-D-glucosaminide of the formula:



wherein each of R^1, R^2 and R^3 is hydrogen, lower alkyl, fluorine, chlorine, bromine, or iodine and Y^2 is an alkali metal from the group of lithium, sodium and potassium.

4,433,140

TRIDECADEOXYNUCLEOTIDE, PROCESS FOR PREPARATION THEREOF, AND USE THEREOF

Hartmut Seliger, Ulm-Lehr, Fed. Rep. of Germany; Eva Rastl, and Peter Swetly, both of Vienna, Austria, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,851

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3106982

Int. Cl.³ C07H *15/12, 17/00*

U.S. Cl. 536—27 **1 Claim**

1. A tridecadeoxynucleotide of the formula dCCTTCTGGAACTG in substantially pure form.

4,433,141

INTERMEDIATE FOR USE IN THE PREPARATION OF CEPHALOSPORIN ANTIBIOTICS

William R. Jones, Greenford; Harish S. Trivedi, London, and Timothy L. Gane, Ruislip, all of England, assignors to Glaxo Group Limited, London, England

Division of Ser. No. 239,203, Mar. 3, 1981, Pat. No. 4,369,313, which is a continuation of Ser. No. 152,852, May 23, 1980, now abandoned.

This application Sep. 30, 1982, Ser. No. 429,134

Claims priority, application United Kingdom, May 25, 1979, 7918428

Int. Cl.³ C07D *501/38;* **A61K** *31/545*

U.S. Cl. 544—25 **1 Claim**

1. The N,N-dimethylformamide solvate of (6R,7R)-7-[(Z)-2-(2-tritylaminothiazol-4-yl)-2-(2-t-butoxycarbonylprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylate.

4,433,142

PROCESS FOR THE PREPARATION OF 7-(2-AMINO-2-PHENYLACETAMIDO) CEPHEM DERIVATIVES

Keizo Takayanagi, Gumma; Yasuhide Tanaka, Saitama; Tasuke Kawabata, Saitama; Fujio Nakamura, Saitama; Yukio Morita, Saitama; Shigeto Negi, Tokyo; Takeo Kanai, and Eiichi Morita, both of Saitama, all of Japan, assignors to Eisai Co., Ltd., Japan

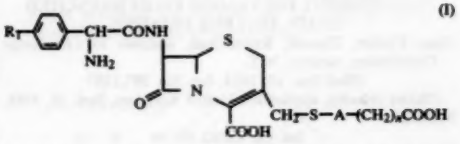
Filed May 7, 1982, Ser. No. 376,214

Claims priority, application Japan, May 15, 1981, 56-72173

Int. Cl.³ C07D *501/04, 544/29*

U.S. Cl. 544—26 **12 Claims**

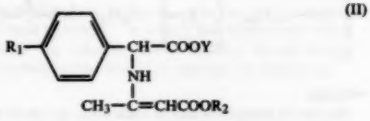
1. A process for preparing a 7-(2-amino-2-phenylacetamido)-cephem derivative represented by the formula (I):



(I)

wherein R_1 is a hydrogen atom or hydroxyl group, n stands for 0, 1 or 2, and A denotes tetrazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-triazolyl, or 1,3,4-triazolyl or a direct bond coupling directly the sulfur atom and the $-(CH_2)_nCOOH$ group together or a pharmaceutically acceptable salt thereof, which process consists essentially of the following consecutive steps:

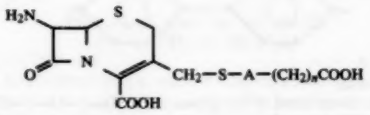
(a) reacting a compound of the formula II:



(II)

wherein R_1 has the same significance as defined above, R_2 means a lower alkyl and Y represents an alkali metal, with a chloroformate;

(b) reacting the reaction product of step (a) with a compound having the formula (III):



(III)

wherein n and A have the same meaning as defined above or its pharmaceutically acceptable salt; and

(c) subjecting the reaction product of step (b) to hydrolysis by adding water thereto.

4,433,143

METHYLATED METHYLOLATED MELAMINE COMPOSITION

J. Owen Santer, East Longmeadow, and George T. Spitz, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 9, 1981, Ser. No. 300,549

Int. Cl.³ C07D *251/70*

U.S. Cl. 544—196 **4 Claims**

1. A methylated methylolated melamine composition comprising a combined formaldehyde content in the range of about 2.4 to about 3.2 moles per mole of melamine and a combined methanol content in the range of about 2.3 to about 3.0 moles per mole of melamine and a combined methanol content in the range of about 0.7 to about 1.0 mole per mole of combined formaldehyde and possessing a first elution ratio in the range of about 0.1 to about 1.5 and a second elution ratio in the range of about 0.2 to about 1.1, and an oligomer content of no more than about 70 percent by weight.

4,433,144
GLYCOLURIL SALTS AND A PROCESS FOR THE PREPARATION THEREOF

Ludwig Rottmaier, Odenthal, and Rudolf Merten, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

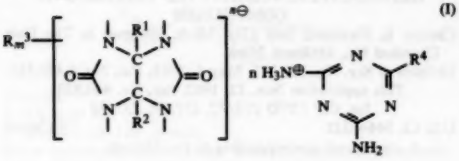
Continuation-in-part of Ser. No. 356,022, Mar. 8, 1982, abandoned. This application May 17, 1982, Ser. No. 378,894

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109478

Int. Cl.³ C07D 487/04

U.S. Cl. 544—198 **8 Claims**

1. A glycoluril-triazine salt of the formula (I):



(I)

wherein:

R_1 and R^2 each independently represent hydrogen, an aliphatic C_1–C_{20} or an aromatic C_6–C_{10} radical,

R_3 represents hydrogen, an aliphatic C_1–C_{20}, a cycloaliphatic C_4–C_{15}, an araliphatic C_7–C_{15} or an aromatic C_6–C_{15} radical,

R^4 represents hydrogen, an amino group, an aliphatic C_1–C_{20}, a cycloaliphatic C_4–C_{17}, an araliphatic C_7–C_{17} or an aromatic C_6–C_{15} radical,

n represents an integer from 1 to 4,

m represents 4−n,

and the radicals R^1, R^2, R^3 and R^4 may each independently be substituted by hydroxyl, halogen or a C_1–C_4 alkoxy group.

4,433,145
TRIAZINE STABILIZERS

Hartmut Wiezer, Gersthofen, and Gerhard Pfahler, Augsburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

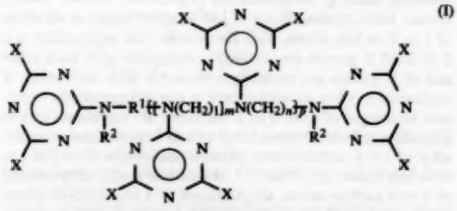
Filed Nov. 3, 1980, Ser. No. 203,236

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944729

Int. Cl.³ C07D 401/14

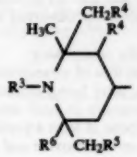
U.S. Cl. 544—198 **1 Claim**

1. A triazine compound of the formula



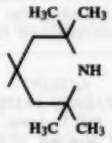
(I)

in which p is 1, R^2 represents hydrogen, a C_1- to C_6-alkyl group or a group of the formula

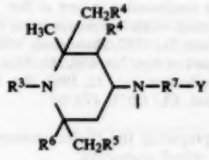


(II)

in which R^3 is hydrogen or C_1- to C_{18}-alkyl, R^4 and R^5 are either identical and are hydrogen or a C_1- to C_5-alkyl group, in which case R^6 is a methyl group, or R^4 is hydrogen or C_1- to C_5-alkyl, and R^5 and R^6, together with the carbon atoms to which they are bonded, represent a C_5- or C_6-cycloalkyl ring or a group of the formula



X is a group of the fomrula



(III)

in which R^3, R^4, R^5 and R^6 have the meaning already given, R^7 represents an alkylene group which has 2 to 4 C atoms and can be substituted by a methyl group and Y represents a group of the formula —OR^8 or —$N(R^9)_2$, in which R^8=C_1- to C_{18}-alkyl and R^9=methyl or ethyl, with the proviso that —R^7—Y is other than —CH_2CH_2—OH, and, R^1 is an alkylene group of the formula —$(CH_2)_r$—, in which, in the case where m=0, the indices r and n can be identical or different and represent an integer from 2 to 6, but in the case where m=1, 2 or 3, the index l represents 2 or 3 and the indices r and n are identical and likewise represent 2 or 3.

4,433,146
PROCESS FOR THE PREPARATION OF MELAMINE

Jozeph H. M. Beckers, Heerlen, and Rudolf Sipkema, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 16, 1982, Ser. No. 368,972

Claims priority, application Netherlands, Apr. 7, 1982, 8201480

Int. Cl.³ C07D 251/60

U.S. Cl. 544—201 **11 Claims**

1. In a process for the preparation of melamine from urea or thermal decomposition products thereof wherein a gaseous reaction mixture containing melamine, ammonia, and carbon dioxide is formed, and wherein

said ammonia and carbon dioxide, after separation of melamine therefrom, and water vapor are condensed in a condensing zone maintained at a pressure of between about 0.5 and 70 bar to form an aqueous solution of ammonium carbamate, and

said aqueous solution of ammonium carbamate is increased in pressure to at least about 100 bar, heated and introduced into a urea synthesis zone wherein at least a portion of said

ammonium carbamate is converted into urea at a pressure of between about 100 and 200 bar to form a urea synthesis effluent containing urea, unconverted ammonium carbamate and water,

the improvement essentially comprising

heating said aqueous solution of ammonium carbamate from said condensing zone, after being increased in pressure to at least about the pressure in said urea synthesis zone, sufficiently to decompose at least a portion of said ammonium carbamate into carbon dioxide and ammonia, to form a gas-liquid mixture, and

introducing said gas liquid mixture into said urea synthesis zone in which said ammonia and carbon dioxide are recondensed to form ammonium carbamate, and ammonium carbamate is converted into urea,

wherein the amount of ammonium carbamate decomposed in said aqueous solution and introduced into said urea synthesis zone is such that the heat released by said recondensation of ammonia and carbon dioxide to ammonium carbamate is at least sufficient to provide all of the heat required for said conversion of ammonium carbamate into urea.

4,433,147

PROCESS FOR PREPARING 10-DEAZAMINOPTERINS

Joseph I. DeGraw, Jr., 880 Hanover Ave., Sunnyvale, Calif. 94087, and Francis M. Sirotnak, 80 E. End Ave., New York, N.Y. 10028

Division of Ser. No. 233,280, Feb. 10, 1981, Pat. No. 4,369,319, which is a division of Ser. No. 75,913, Sep. 17, 1979, Pat. No. 4,393,064, which is a continuation-in-part of Ser. No. 883,627, Mar. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 761,152, Jan. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 664,213, Mar. 5, 1976, abandoned. This application Jan. 22, 1982, Ser. No. 344,564

Int. Cl.³ C07D *475/08*

U.S. Cl. 544—260 **10 Claims**

1. A process for preparing the 10-deazaminopterin and its 10-alkyl derivatives, which comprises

(1) reacting 3-chloro-1-methoxy-propene with the reaction product of alkyl lithium with a p-alkyl-benzoic acid in which the alkyl group has the structure:

corresponding to the 10-carbon group of the desired 10-deazaminopterin, wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl having from one to eight carbon atoms, in the presence of an acid acceptor at a temperature below 0° C. at which the reaction proceeds in the presence of an inert solvent under anhydrous conditions, thereby substituting a methoxy-propylene group at the p-alkyl group of the acid;

(2) converting the methoxy-propylene group to a bromoacetaldehyde group by reaction with bromine while maintaining the pH within the range from about 7 to about 8, with addition of a buffer if necessary to maintain the pH below 8;

(3) reacting this reaction product with 2,4,5,6-tetraaminopyrimidine at an acid pH within the range from about 3 to about 5 and an elevated temperature within the range from about 35 to about 75° C., cyclizing the 5,6-amino groups thereof with the aldehyde and bromine groups of this reaction product, and forming a dihydropteridine ring containing the 5,6-nitrogen atoms in the ring;

(4) dehydrogenating the pteridine ring by reaction with potassium iodide/iodine KI_3, thereby forming the corresponding 4-amino-4-desoxy-10-deazapteroic acid;

(5) reacting the 4-amino-4-desoxy-10 deazapteroic acid with isobutyl chloroformate in the presence of an acid acceptor at a temperature within the range from 0° to −5° C.; adding diethyl-L-glutamate hydrochloride to the reaction mixture, and continuing the reaction at a temperature within the range from 0° to −5° C., thereby converting the pteroic acid group to the corresponding glutamide diethyl ester; and then

(6) hydrolyzing off the esterifying ethyl groups by reacting the ester with dilute aqueous alkali, forming the free diacid of the glutamide group and completing the 10-deazaminopterin compound.

4,433,148

HETEROCYCLIC SUBSTITUTED TRIAZOL-3-OL COMPOUNDS

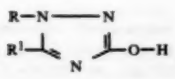
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 260,527, May 4, 1981, Pat. No. 4,400,516. This application Nov. 12, 1982, Ser. No. 440,933

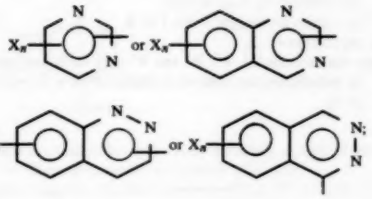
Int. Cl.³ C07D *239/72, 237/28, 237/30*

U.S. Cl. 544—322 **4 Claims**

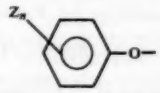
1. A compound corresponding to the formula



wherein R represents a nitrogen containing heterocyclic radical corresponding to the formulae



each X independently represents chloro, fluoro, bromo, nitro, alkyl of 1 to 4 carbon atoms, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, cyano, trifluoromethyl, trichloromethyl, phenoxy or substituted phenoxy of the formula



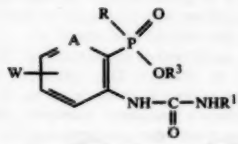
wherein each Z independently represents chloro, fluoro, bromo, nitro, cyano, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; Y represents oxygen or sulfur; each n can independently represent an integer of from 0 to 3, inclusive; R^1 represents hydrogen, chloro, fluoro, bromo, alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylthio, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, thiocyanato, trifluoromethyl, trichloromethyl, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms.

4,433,149
ESTERS OF UREIDO-PHENYL (OR PYRIDYL) PHOSPHINIC ACIDS

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

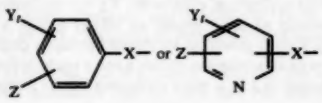
Continuation-in-part of Ser. No. 296,031, Aug. 25, 1981, abandoned. This application May 19, 1982, Ser. No. 379,584
Int. Cl.³ C07F 9/32, 9/58
U.S. Cl. 546—21 5 Claims

1. A compound of the following formula (III):



(III)

wherein,
A is CH or N;
R is lower alkyl or phenyl;
R^1 is hydrogen, lower alkyl, lower cycloalkyl, or phenyl, unsubstituted or substituted at one, two or three of the ring carbon atoms by radicals selected from halogen, lower alkyl, lower alkoxy, lower haloalkyl, or lower alkylthio;
R^3 is lower alkyl; and
W is hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, halogen or the group



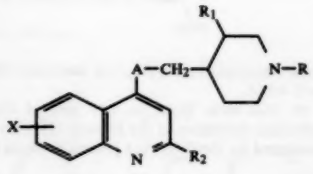
where X is oxygen, sulfur, sulfinyl or sulfonyl; t is zero, one or two; and Y and Z is independently selected from hydrogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy or halogen.

4,433,150
2-(4-PIPERIDYL)-1-(4-QUINOLYL)-ETHANONES AND ETHANES

Alain A. Champseix, Orsay; Gerard R. Le Fur, Plessis Robinson, and Christian L. A. Renault, Taverny, all of France, assignors to Pharmindustrie, Gennevilliers, France

Filed Dec. 2, 1980, Ser. No. 212,293
Claims priority, application France, Dec. 21, 1979, 79 31396
Int. Cl.³ C07D 401/06; A61K 31/47
U.S. Cl. 546—168 14 Claims

1. A compound of the formula:



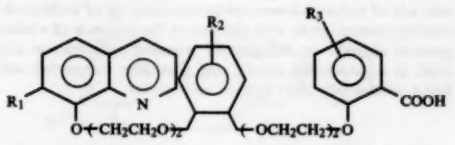
in which
R is hydrogen, alkyl having 1 to 4 carbons or phenylalkyl of which the alkyl has one or two carbons,
R_1 is hydrogen, alkyl having 1 to 4 carbons or alkenyl of 2 to 4 carbons,
R_2 is phenyl or phenyl substituted by one substituent taken from the halogens, alkyl and alkoxy having 1 to 4 carbons
X is fixed in position 5, 6, 7 or 8 on the quinoline ring and represents hydrogen, halogen, or alkyl having 1 to 4 carbons
and A represents CO or CH_2, and its addition salts with pharmaceutically acceptable acids.

4,433,151
OXY BENZOIC ACID TERMINATED POLYETHER DERIVATIVES OF 8-HYDROXY QUINOLINES

Kazuhisa Hiratani, Ibaragi, Japan, assignor to Director-General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,107
Claims priority, application Japan, Mar. 9, 1981, 56-34101
Int. Cl.³ C07D 215/24, 215/26, 215/30
U.S. Cl. 546—178 4 Claims

1. A polyether having the following general formula:



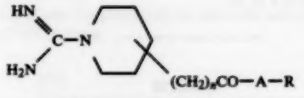
wherein R_1, R_2 and R_3 each stand for hydrogen, a tert-butyl group or an allyl group, with the exception that R_1, R_2 and R_3 cannot stand for hydrogen at the same time.

4,433,152
AMIDINOPIPERIDINE DERIVATIVES

Mutsumi Muramatsu; Toshio Satoh, both of Tokushima; Hiroyasu Sekine, Kisai; Atsushi Tendo; Yoshio Kikawa, both of Misato, and Kaname Kondo, Koshigaya, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,714
Claims priority, application Japan, May 25, 1981, 56-78142; May 25, 1981, 56-78143; Aug. 22, 1981, 56-130856
Int. Cl.³ C07D 401/12
U.S. Cl. 546—193 3 Claims

1. A compound of the following formula or a pharmaceutically acceptable salt thereof,



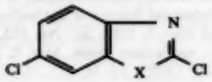
wherein R represents a hydrogen atom, a naphthyl, indanyl, tetrahydronaphthyl or pyridyl group, or a phenyl group which optionally contains 1 to 3 substituents selected from the group consisting of a halogen atom, and a lower alkyl, lower alkenyl, lower alkoxy, lower alkanoyl, cyclohexyl, cyano, formyl, trifluoromethyl, phenyl, phenylloweralkyl, lower alkanoylamino, aminosulfonyl, carboxyl, lower alkoxycarbonyl, benzyloxycarbonyl, benzoylvinyl, phenylvinylcarbonyl, carboxyvinyl, and diphenylmethyloxycarbonylvinyl group, A represents an oxygen or sulfur atom, and n represents an integer of 0 to 3, with the proviso that when n is an integer of 0, R is not a hydrogen atom.

4,433,153
PROCESS FOR THE MANUFACTURE OF 2,6-DICHLOROBENZOXAZOLE AND 2,6-DICHLOROBENZTHIAZOLE

Harald Knorr, Gersthofen; Reinhard Handte, Hofheim am Taunus; Lothar Willms, Unkel, and Thomas Tammer, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,215
Int. Cl.³ C07D *263/58, 277/68*
U.S. Cl. 548—152 **7 Claims**

1. In a process for the manufacture of 2,6-dichlorobenzthiazole or 2,6-dichlorobenzoxazole of the formula



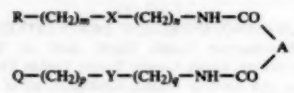
wherein X represents oxygen or sulfur, the improvement which comprises the step of chlorinating a potassium mercaptide salt of 6-chloro-3-mercaptobenzoxazole or of 6-chloro-2-mercaptobenzthiazole with chlorine in the presence of a halogenated aliphatic or halogenated aromatic hydrocarbon solvent, as a suspending means, said potassium mercaptide salt being substantially inert toward said solvent.

4,433,154
BIS(CARBOXAMIDE) DERIVATIVES

Kentaro Hirai, Kyoto, Japan, assignor to Shionogi & Company, Limited, Osaka, Japan

Filed Dec. 7, 1981, Ser. No. 328,444
Int. Cl.³ C07D *277/38, 417/12, 403/12, 405/12*
U.S. Cl. 548—195 **17 Claims**

1. A compound of the formula:



(wherein
A is C_2–C_4 alkylene, C_2–C_4 alkenylene, $—CH_2SCH_2$ or phenylene;
R and Q each is phenyl, thiazolyl, thienyl, or furyl respectively substituted by dimethylaminomethyl, 1-pyrrolidinylmethyl, or guanidino;
X and Y each is oxa or thia;
m and p each is 0 or 1; and
n and q each is 2 or 3).

4,433,155
INHIBITORS FOR FURFURALS

Jo Ann Gilpin, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1982, Ser. No. 382,874
Int. Cl.³ C07D *307/46, 307/48*
U.S. Cl. 549—205 **11 Claims**

1. A process for inhibiting or reducing resinification of furfural or derivatives thereof comprising combining with the furfural or derivative thereof an effective amount to prevent or reduce resin formation of an epoxy compound.

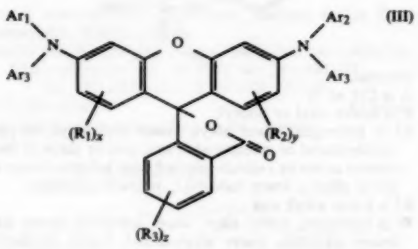
8. A composition comprising furfural or a derivative thereof and an effective amount to prevent resin formation of an epoxy compound.

4,433,156
PROCESS FOR PREPARING FLUORAN DERIVATIVES

Sadao Ishige; Kozo Sato, and Ken Iwakura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1982, Ser. No. 365,129
Claims priority, application Japan, Apr. 3, 1981, 56-50258
Int. Cl.³ C07D *493/10*
U.S. Cl. 549—227 **4 Claims**

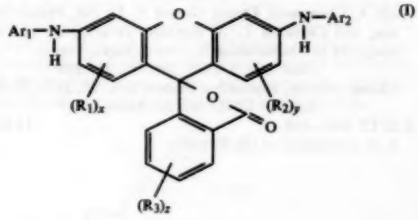
1. A process for preparing 3,6-bis-diarylaminofluoran derivatives represented by the following general formula (III):



(III)

wherein each of Ar_1, Ar_2, and Ar_3 independently represents an aryl group, each of R_1, R_2, and R_3 independently represents an alkyl group, an alkoxy group, a halogen atom, a nitro group, an alkylamino group, a dialkylamino group or an acylamino group, x and y each represents 0 or an integer of 1 to 3, and z represents 0 or an integer of 1 to 4,

which comprises reacting in a single reaction step a 3,6-bis-arylaminofluoran derivative represented by the following general formula (I):



(I)

wherein Ar_1, Ar_2, R_1, R_2, R_3, x, y, and z are the same as defined above,

with 2.0 to 10.0 mols based on one mol of the 3,6-bis-arylaminofluoran derivative of the formula (I) of an arylating agent represented by the following general formula (III):

$$Ar_3—X \qquad \text{(II)}$$

wherein Ar_3 is the same as defined above, and x represents a halogen atom or a sulfonyloxy group represented by $—OSO_2R_4$ (R_4 represents an alkyl group or an aryl group), whereby both of the arylamino groups of the 3,6-bis-arylaminofluoran derivative of the formula (I) are arylated at the same time.

4,433,157

PROCESS FOR MANUFACTURING ANHYDRIDES OF ALKENYL DICARBOXYLIC ACIDS

Jerome Weill; Jacques Garapon, both of Lyons, and Bernard Sillion, Rocquencourt, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 11, 1982, Ser. No. 377,114
Claims priority, application France, May 11, 1981, 81 09473
Int. Cl.³ C07D *307/60*
U.S. Cl. 549—255 9 Claims

1. In a process for manufacturing an alkenyl dicarboxylic acid anhydride, by reacting at least one halogenated polyolefin with at least one unsaturated dicarboxylic acid anhydride in substantially stoichiometric proportions, the improvement comprising effecting said reaction at a temperature of 150°-200° C., in the presence of a minor proportion of at least one organic compound containing a double bond bearing at least one electron-attracting substituent and having a lower electron density than an unsubstituted double bond, said organic compound being substantially unreactive with dehydrohalogenated halogenated polyolefin.

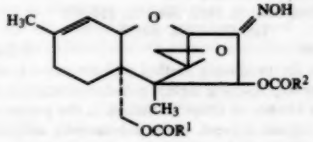
4,433,158

3-HYDROXYIMINOSCIRPEN-4β, 15-DIOL ESTERS USEFUL AS ANTITUMOR AGENTS

Takushi Kaneko, Fayetteville; John M. Essery, Pleasantville; Henry Schmitz, Syracuse, and Terrence W. Doyle, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 223,594, Jan. 9, 1981, Pat. No. 4,332,951.
This application Dec. 28, 1981, Ser. No. 335,297
Int. Cl.³ C07D *311/78*
U.S. Cl. 549—332 12 Claims

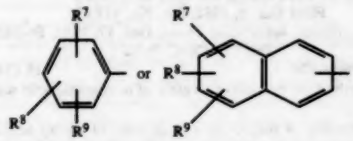
1. A compound having the formula



wherein R^1 and R^2 are each independently (lower)alkyl; halo(lower)alkyl; alkenyl of the formula $—CR^3{=}CR^4R^5$ in which R^3 is hydrogen, (lower)alkyl or 1'-halo(lower)alkyl and R^4 and R^5 are each independently hydrogen or (lower)alkyl; alkynyl of the formula $—C{\equiv}CR^6$ in which R^6 is hydrogen or (lower)alkyl; or a radical of the formula

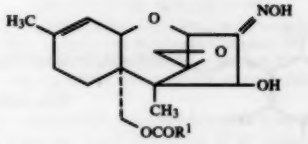
$$AR—(CH_2)_m—$$

in which m is 0 or an integer from one to four and Ar is



wherein R^7, R^8 and R^9 are each independently hydrogen, halogen, (lower)alkyl or (lower)alkoxy, with the proviso that R^1 and R^2 may not both be a (lower)alkyl radical.

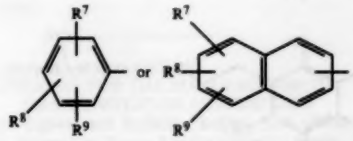
8. A compound having the formula



wherein R^1 is halo(lower)alkyl; alkenyl of the formula $—CR^3{=}CR^4R^5$ in which R^3 is hydrogen, (lower)alkyl or 1'-halo(lower)alkyl and R^4 and R^5 are each independently hydrogen or (lower)alkyl; alkynyl of the formula $—C{\equiv}CR^6$ in which R^6 is hydrogen or (lower)alkyl; or a radical of the formula

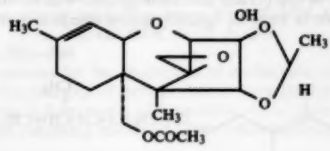
$$Ar—(CH_2)_m—$$

in which m is 0 or an integer from one to four and Ar is



wherein R^7, R^8 and R^9 are each independently hydrogen, halogen, (lower)alkyl or (lower)alkoxy.

12. The compound having the formula



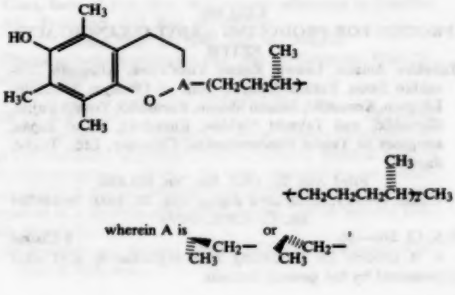
4,433,159

SYNTHESIS OF OPTICALLY ACTIVE D-ALPHA TOCOPHEROL

Kimio Hamamura, Kashiwa; Kozo Akasaka, and Youji Yamagishi, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

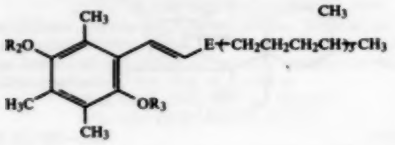
Filed Feb. 18, 1982, Ser. No. 349,950
Claims priority, application Japan, Feb. 19, 1981, 56-22212
Int. Cl.³ C07D *311/72, 303/14*
U.S. Cl. 549—411 8 Claims

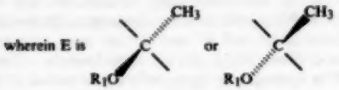
1. A process for preparing an optically active alpha-tocopherol of the formula



wherein A is

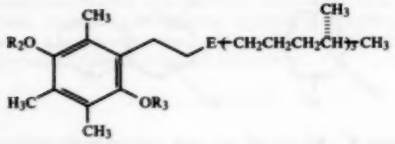
starting with an optically active compound of the formula



wherein E is 

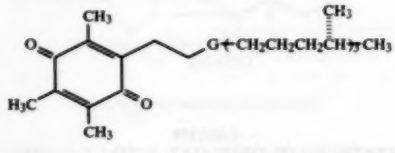
and R_1, R_2 and R_3 are protecting groups for hydroxyl functions which comprises

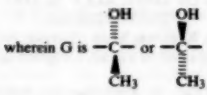
(1) catalytically hydrogenating the double bond in the aliphatic chain of the starting compound to form an optically active compound of the formula



wherein E, R_2 and R_3 are the same as defined above,

(2) removing the protecting groups R_1, R_2 and R_3 from the product of step (1) and then treating same with an oxidizing agent to form an optically active compound of the formula



wherein G is 

and

(3) effecting cyclization of the product of step (2) to obtain said optically active alpha-tocopherol.

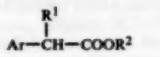
4,433,160

PROCESS FOR PRODUCING α-ARYLALKANOIC ACID ESTER

Takehiro Amano, Urawa; Kensei Yoshikawa, Kitamoto; Tatsuhiko Sano; Yutaka Ohuchi, both of Ohmiya; Michihiro Ishiguro, Kurashiki; Manzo Shiono, Kurashiki; Yoshiji Fujita, Kurashiki, and Takashi Nishida, Kurashiki, all of Japan, assignors to Taisho Pharmaceutical Company, Ltd., Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,480
Claims priority, application Japan, Aug. 26, 1981, 56-134781
Int. Cl.³ C07L 69/76
U.S. Cl. 560—56 **8 Claims**

1. A process for producing an α-arylalkanoic acid ester represented by the general formula

 (I)

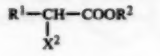
wherein Ar represents an aryl group which may optionally be substituted, and R^1 and R^2, independently from each other, represent a lower alkyl group,

which comprises reacting a Grignard reagent prepared from an aryl halide of the general formula

(II)

wherein Ar is as defined above and X^1 represents a halogen atom,

and magnesium, with an α-haloalkanoic acid ester of the general formula

 (III)

wherein R^1 and R^2 are as defined above, and X^2 represents a halogen atom,

said reaction of the Grignard reagent with the α-haloalkanoic acid ester of general formula (III) being carried out in the presence of a catalytic amount of a nickel compound.

4,433,161

METHYL P-(ω-ACETOXYALKOXY) BENZOATE AND METHOD OF PREPARATION

Shalaby W. Shalaby, Mountainville; Edgar S. Schipper, Cranford, and Donald F. Koelmel, Lebanon, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 8, 1982, Ser. No. 355,976
Int. Cl.³ C07C 69/78
U.S. Cl. 560—66 **5 Claims**

1. A process for producing methyl p-(4-acetoxy-n-butoxy) benzoate comprising reacting methyl p-hydroxybenzoate with an α,ω acetoxy bromo- or chloro-n-butane, in the presence of a base and an organic solvent, under substantially anhydrous conditions to yield methyl p-(4-acetoxy-n-butoxy) benzoate.

4,433,162

METHOD FOR PREPARING AN ESTER OF NITROACETIC ACID

Toshikazu Hamamoto, and Ryoji Sugise, both of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Dec. 6, 1982, Ser. No. 447,471
Claims priority, application Japan, Dec. 17, 1981, 56-202545
Int. Cl.³ C07C 76/02
U.S. Cl. 560—156 **16 Claims**

1. A method for preparing an ester of nitroacetic acid which comprises;

(1) a first step of subjecting a vinyl ester of a fatty acid and a nitrogen oxide to reaction with each other in the presence of a gas containing molecular oxygen in a solvent; and

(2) a second step of subjecting the resultant reaction product of the first step to reaction with an alcohol.

4,433,163

PROCESS FOR THE PRODUCTION OF 3,3-DIMETHYLGLUTARIC ACID OR ITS ESTERS

Pavel Lehky, Naters, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Filed May 24, 1982, Ser. No. 381,342

Claims priority, application Switzerland, May 27, 1981, 3474/81

Int. Cl.³ C07C 67/42, 51/34

U.S. Cl. 560—204 8 Claims

1. Process for the production of 3,3-dimethylglutaric acid or its methyl ester, ethyl ester, propyl ester, isopropyl ester, butyl ester, isobutyl ester, pentyl ester or hexyl ester from dimedone comprising converting dimedone with ozone into an ozone-addition product and converting the ozone-addition product by hydrolysis into the 3,3-dimethylglutaric acid or by alcoholysis into one of its esters.

4,433,164

ESTERS OF β,γ-UNSATURATED CARBOXYLIC ACIDS BY CARBONYLATION OF CONJUGATED DIENES

Jean Jenck, Villeurbanne, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jan. 20, 1982, Ser. No. 341,101

Claims priority, application France, Jan. 23, 1981, 81 01205

Int. Cl.³ C07C 67/38

U.S. Cl. 560—207 24 Claims

1. A process for the preparation of an ester of a β,γ-unsaturated carboxylic acid, comprising carbonylating a conjugated diene with carbon monoxide, at a temperature ranging from about 50° to 150° C. under a carbon monoxide pressure ranging from about 50 to 300 bars, and in the presence of (i) an alcohol corresponding to the desired ester, (ii) a halogen hydracid, (iii) a palladium catalyst which comprises palladium metal, a palladium oxide, or a salt of palladium, or ionic complex thereof, the anion coordinated with the palladium cation of which being a hard or intermediate base, the ratio of halogen hydracid to palladium being at least 5, and (iv) a quaternary onium salt of nitrogen, phosphorus or arsenic, said nitrogen, phosphorus or arsenic being tetracoordinated with carbon atoms and the anion of said salt comprising a hard or intermediate base.

4,433,165

PROCESS FOR STABILIZING CARBONYLATION CATALYST IN SOLUBLE FORM

Thomas C. Singleton, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1980, Ser. No. 221,230

Int. Cl.³ C07C 51/10, 51/12, 67/36, 67/37

U.S. Cl. 562—519 4 Claims

1. In a carbonylation process wherein at least one reactant selected from the group consisting of an alcohol, an ester derivative of said alcohol, a halide derivative of said alcohol and an ether derivative of said alcohol is (1) reacted with carbon monoxide in a liquid phase in a reaction zone and in the presence of a catalyst system that contains (a) a rhodium component, and (b) an iodine or bromine component, (2) passing at least a portion of the liquid reaction mass in which the carbon monoxide has been depleted from the reaction zone to a separation zone, and (3) recycling the remaining liquid reaction mass from the separation zone to said reaction zone, the improvement which comprises adding to the carbon monoxide deficient zones of the process an amount of a stabilizer component selected from N,N,N',N'-tetramethyl-o-phenylenediamine and 2,3'-dipyridyl, said amount being sufficient to maintain the rhodium component in soluble form.

4,433,166

PROCESS FOR STABILIZING CARBONYLATION CATALYST IN SOLUBLE FORM

Thomas C. Singleton, Texas City, Tex., and Frank E. Paulik, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1980, Ser. No. 221,231

Int. Cl.³ C07C 51/10, 51/12, 67/36, 67/37

U.S. Cl. 562—519 10 Claims

1. In a carbonylation process wherein at least one reactant selected from the group consisting of an alcohol, an ester derivative of said alcohol, a halide derivative of said alcohol and an ether derivative of said alcohol is (1) reacted with carbon monoxide in a liquid phase in a reaction zone and in the presence of a catalyst system that contains (a) a rhodium component, and (b) an iodine or bromine component, (2) passing at least a portion of the liquid reaction mass in which the carbon monoxide has been depleted from the reaction zone to a separation zone, and (3) recycling the remaining liquid reaction mass from the separation zone to said reaction zone, the improvement which comprises adding to the process an amount of a tin component which may be tin or a tin compound, said amount being sufficient to maintain the rhodium component in soluble form.

4,433,167

PROCESS FOR THE MANUFACTURE OF METHACRYLIC OR ACRYLIC ACID

Masanobu Ogawa, and Toshitake Kojima, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Japan

Continuation of Ser. No. 141,009, Apr. 17, 1980, abandoned; which is a continuation of Ser. No. 959,499, Nov. 13, 1978, abandoned; which is a division of Ser. No. 758,352, Jan. 10, 1977, Pat. No. 4,138,363

This application Mar. 4, 1982, Ser. No. 354,723

Claims priority, application Japan, Nov. 27, 1976, 51-141784

Int. Cl.³ C07C 51/25, 57/055

U.S. Cl. 562—534 5 Claims

1. A process for the production of methacrylic or acrylic acid by the oxidation of methacrolein or acrolein with molecular oxygen in the presence of steam in the vapor phase by using a catalyst consisting essentially of the following composition:

$$Pd_aP_bSb_cX_dO_e$$

wherein X denotes at least one element selected from the group consisting of potassium, sodium, rubidium, lithium, cerium, beryllium, magnesium, calcium, vanadium, strontium, zinc, thorium and rhenium, the subscripts a, b, c, d and e denote the number of the Pd, P, Sb, X and O atoms, and whrein a is 1, b is 1 to 42, c is 0.1 to 15, d is 0.1 to 15 and e is a number determined by the valences of the other elements and is from 3.7 to 143.5.

4,433,168

PROCESS FOR THE PURIFICATION OF CRUDE 3,4,3',4'-TETRAAMINODIPHENYL

Hans Schubert, Kelkheim, and Konrad Baessler, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst AG., Frankfurt, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,670

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111470

Int. Cl.³ C07C 87/50

U.S. Cl. 564—309 10 Claims

1. A method for purifying crude copper-contaminated 3,4,3',4'-tetraaminodiphenyl (TAD), directly isolated from a reaction mixture in which it has been prepared by the ammonolysis of 3,3'-dichlorobenzene with excess ammonia and in the presence of a catalyst containing copper, which method consists essentially of

(1) washing said isolated crude TAD with an aqueous solution of NH_3 and

(2) subsequently washing the ammonia-washed TAD with water until it is neutral.

4. A method for purifying crude copper-contaminated 3,4,3',4'-tetraaminodiphenyl (TAD), directly isolated from a reaction mixture in which it has been prepared by the ammonolysis of 3,3'-dichlorobenzene with excess ammonia and in the presence of a catalyst containing copper, which method consists essentially of

(1) washing said isolated crude TAD with an aqueous solution of NH_3,

(2) subsequently washing the ammonia-washed TAD with water until it is neutral,

(3) then dissolving the washed, neutral TAD by heating in water containing an absorbent and an effective amount of a water-soluble reducing agent, and

(4) precipitating the TAD from such an aqueous solution by cooling the solution.

4,433,169

DIAMINES AND A PROCESS FOR THEIR PREPARATION

Hans-Joachim Scholl, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

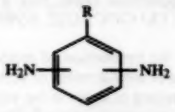
Filed Jan. 28, 1982, Ser. No. 343,652

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105362

Int. Cl.³ C07B 11/00; C07C 76/02, 85/11

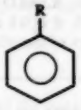
U.S. Cl. 564—419 **1 Claim**

1. A mixture of homologues and isomers of diamines corresponding to the formula



in which R denotes a saturated, straight-chained aliphatic hydrocarbon group having 8–15 carbon atoms which mixture has been prepared by

(a) dinitrating a hydrocarbon corresponding to the general formula



in the form of a mixture of homologues and isomers which hydrocarbons have a boiling range according to ASTMD 86 of 10°–50° C. at 1013 mbar within the temperature range of from 270° C. to 330° C.; and

(b) hydrogenating the nitro groups present in the product of (a).

4,433,170

NOVEL BIS(AMINOETHYL)ETHER DERIVATIVES USEFUL AS POLYURETHANE CATALYSTS

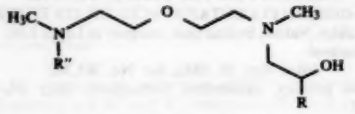
Robert L. Zimmerman, Austin, and Ernest L. Yeakey, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,427

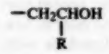
Int. Cl.³ C07C 93/04, 91/04, 91/12, 91/10

U.S. Cl. 564—508 **3 Claims**

1. A composition of matter having the formula



where R is hydrogen or lower alkyl and R" is methyl or



4,433,171

SULPHONES HAVING A 1,5-DIMETHYL-HEXA-1,5-DIENYLENE GROUP

Pierre Chabardes, Sainte Foy-les-Lyon; Marc Julia, Paris, and Albert Menet, Colmar, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 759,474, Jan. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 328,537, Feb. 1, 1973, Pat. No. 4,331,814. This application Feb. 4, 1982, Ser. No. 345,748

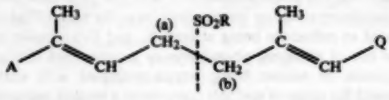
Claims priority, application France, Feb. 2, 1972, 72.03482; Apr. 10, 1972, 72.12477

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ C07C 147/06

U.S. Cl. 568—33 **5 Claims**

1. A sulfone of the formula:



wherein A represents 2-(2,6,6-trimethyl-cyclohex-1-enyl)-ethenyl, R is an aryl radical substituted with a fluorine atom, a bromine atom, or an alkoxy group, and the sulfonyl group $—SO_2R$ replaces a hydrogen atom on carbon (a) or (b), and Q is an etherified primary alcohol group $—CH_2OH$, or the primary alcohol group $—CH_2OH$, or a free aldehyde group or an acetal group, or the sulfonyl group $—SO_2R$ replaces a hydrogen atom on carbon atom (a) and Q is an esterified primary alcohol group $—CH_2OH$.

4,433,172

PRODUCTION OF DIHYDROXY ARYLOPHENONES

John B. Rose, Letchworth, and Michael B. Cinderey, Knebworth, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 24, 1982, Ser. No. 410,995

Claims priority, application United Kingdom, Sep. 17, 1981, 8128177

Int. Cl.³ C07C 45/54

U.S. Cl. 568—319 **3 Claims**

1. A process for the production of 4,4'-dihydroxybenzophenone which comprises reacting diphenyl carbonate in the presence of a fluoroalkane sulphonic acid.

4,433,173

ACETOPHENONE PURIFICATION

Vijai P. Gupta, Berwyn; Frank W. Melpolder, Wallingford, and Walter A. Mameniskis, Drexel Hill, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 2, 1982, Ser. No. 384,317
Int. Cl.³ C07C 45/83
U.S. Cl. 568—324 9 Claims

1. A process for the purification of acetophenone from mixtures containing difficulty separable impurities consisting essentially of alkyl, alkyl aromatic, alkylated benzyl alcohol or hydroaromatic compounds having volatilies relative to acetophenone within the range from about 0.9 to 1.1 which process comprises extractive distillation of the mixture with an added solvent selected from the group consisting of oligomers of 1,2-glycols, said oligomers having from 4 to 9 carbon atoms per molecule, and recovering high-purity acetophenone from the bottoms stream of said extractive distillation.

4,433,174

PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ALDEHYDES USING AMS-1B BOROSILICATE CRYSTALLINE MOLECULAR SIEVE

Gary P. Hagen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 26, 1982, Ser. No. 401,548
Int. Cl.³ C07C 47/20
U.S. Cl. 568—459 18 Claims

1. A process for the preparation of alpha, beta-unsaturated aldehydes by reacting formaldehyde with a reactant aldehyde of formula RCH_2CHO wherein R is a member of the class consisting of —H, —alkyl, —aryl, —aralkyl, —cycloalkyl, and —alkylaryl radicals, in the presence of AMS-1B borosilicate crystalline molecular sieve catalyst under reaction conditions wherein the reactant aldehyde:formaldehyde mole ratio is from about 1:1 to 20:1 at a temperature within the range of from about 250° C. to about 430° C.

4,433,175

PROCESS FOR THE PRODUCTION OF PURE NEOHEXANOL

Manfred Kaufhold, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,265
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146493
Int. Cl.³ C07C 29/136, 31/125, 44/29
U.S. Cl. 568—471 14 Claims

1. A process for the production of neohexanol of a purity of above 99%, a chlorine content of less than 10 ppm, and a sulfur content of less than 5 ppm, comprising

esterifying 3,3-dimethylbutyric acid of a chlorine content below 650 ppm with an alkanol of a normal boiling point above 117° C.;

separating the ester by distillation into chlorine rich fractions of chlorine contents above 10 ppm and chlorine poor fractions of chlorine contents below 10 ppm, during which step the chlorine content of the distillate or the sump is continuously controlled by sampling;

hydrogenating the ester with a chlorine content below 10 ppm to form neohexanol, over a barium-activated copper chromite catalyst under a hydrogen pressure of 200–300 bar, at a temperature of 120°–220° C., and with a catalyst load of 0.05–1.0 liter of hydrogenation feed/liter of catalyst.hour.

14. A process for the preparation of neohexanol comprising,

preparing neohexanol of a purity above 99%, a chlorine content <10 ppm and a sulfur content <5 ppm by a process comprising

esterifying 3,3-dimethylbutyric acid of a chlorine content below 650 ppm with an alkanol of a normal boiling point above 117° C.;

separating the ester by distillation into chlorine rich fractions of chlorine contents above 10 ppm and chlorine poor fractions of chlorine contents below 10 ppm, during which step the chlorine content of the distillate or the sump is continuously controlled by sampling;

hydrogenating the ester with a chlorine content below 10 ppm to form neohexanol, over a barium-activated copper chromite catalyst under a hydrogen pressure of 200–300 bar, at a temperature of 120°–220° C., and with a catalyst load of 0.05–1.0 liter of hydrogenation feed/liter of catalyst.hour; and

dehydrogenating the resultant neohexanol to form neohexanal.

4,433,176

PROCESS FOR PREPARING ACETALDEHYDE FROM METHANOL AND SYNTHESIS GAS USING A NOVEL CATALYST COMPOSITION

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,429
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ C07C 47/06
U.S. Cl. 568—487 21 Claims

1. A process for preparing acetaldehyde from methanol and syngas which comprises contacting a mixture of methanol, carbon monoxide and hydrogen with a catalytic amount of an iodide or iodine-free catalyst composition comprising ruthenium powder, a cobalt-containing compound, selected from the group consisting of cobalt oxides, cobalt salts, cobalt carbonyls and derivatives of aforesaid cobalt compounds, a rhodium-containing compound, selected from the group consisting of rhodium oxides, rhodium salts, rhodium carbonyls, rhodium hydrocarbonyls, and derivatives of aforesaid rhodium compounds, an onium base or salt, and maintaining the resulting mixture at a temperature of from 100° C. to 350° C. and pressure of 1000 psi to 6500 psi for sufficient time to produce the acetaldehyde.

4,433,177

PROCESS FOR PREPARING ACETALDEHYDE FROM METHANOL AND SYNTHESIS GAS USING A NOVEL CATALYST COMPOSITION

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,260
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ C07C 47/06
U.S. Cl. 568—487 23 Claims

1. A process for preparing acetaldehyde from methanol and syngas which comprises contacting a mixture of methanol, carbon monoxide and hydrogen with a catalytic amount of an iodide or iodine-free catalyst composition comprising ruthenium powder, a cobalt-containing compound, from the group consisting of cobalt oxides, cobalt salts, cobalt carbonyl compounds and derivatives thereof, an amine, and an onium base or salt, and heating the resulting mixture to a temperature of at least 100° C. and a pressure of at least 500 psi for sufficient time to produce the acetaldehyde.

4,433,178
PROCESS FOR PREPARING ACETALDEHYDE FROM METHANOL AND SYNTHESIS GAS USING A NOVEL CATALYST COMPOSITION

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,430

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ C07C 47/06

U.S. Cl. 568—487 **16 Claims**

1. A process for preparing acetaldehyde from methanol and syngas which comprises contacting a mixture of methanol, carbon monoxide and hydrogen with a catalytic amount of an iodine-free catalyst composition comprising ruthenium powder, a cobalt-containing compound, selected from the group consisting of cobalt oxides, cobalt salts, cobalt carbonyls and derivatives of aforesaid, and a quaternary onium compound, selected from the group consisting of quaternary ammonium salts, quaternary ammonium bases, quaternary phosphonium salts and quaternary phosphonium bases, and heating the resulting mixture to a temperature above 150° C. and a pressure above 500 psi for sufficient time to produce acetaldehyde.

4,433,179
PROCESS FOR THE PREPARATION OF DI- AND POLY-ALLYL ETHERS

Friedrich Lohse, Oberwil, and Charles E. Mounier, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,810

Claims priority, application Switzerland, Aug. 25, 1980, 6386/80

Int. Cl.³ C07C 41/16

U.S. Cl. 568—664 **9 Claims**

1. A process for the preparation of an allyl ether of the formula I

$$R\text{—}(O\text{—}CH_2\text{—}CH{=}CH_2)_n \qquad (I)$$

in which R is an n-valent aliphatic, araliphatic, cycloaliphatic or cycloaliphatic-aliphatic radical and n is a number of at least 2, by reacting a hydroxy compound of the formula II

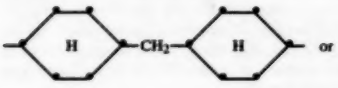
$$R\text{—}(OH)_n \qquad (II)$$

in which R and n are as defined in formula I and the OH groups are bonded to primary or secondary aliphatic C atoms, with allyl chloride or allyl bromide in the presence of a catalyst and in an alkaline medium, which comprises carrying out the reaction by means of phase transfer catalysis, 0.8 to 5 mols of allyl chloride or allyl bromide, 1 to 6 mols of aqueous or solid sodium hydroxide and, as the phase transfer catalyst, 2 to 20 mol % of a quaternary ammonium salt, a quaternary ammonium base or a crown ether being employed per one hydroxyl equivalent of the compound of the formula II, and the reaction being carried out in the temperature range from 20 to 100° C.

8. An allyl ether of the formula I

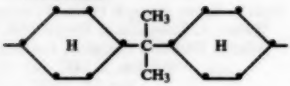
$$R(OCH_2CH{=}CH_2)_n \qquad (I)$$

wherein R is a radical of the formulae



or

-continued



and n is the number 2.

4,433,180
PROCESS FOR THE PREPARATION OF 2-ALKENYL 1,1,2-TRIFLUORO-2-HALOGENOETHYL ETHERS

Konrad von Werner, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 325,846, Nov. 30, 1981, abandoned. This application May 18, 1982, Ser. No. 379,438

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045473

Int. Cl.³ C07C 41/05

U.S. Cl. 568—684 **2 Claims**

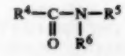
1. A process for the preparation of a 2-alkenyl 1,1,2-trifluoro-2-halogenoethyl ether of the formula

$$R^1HC{=}CR^2\text{—}CHR^3\text{—}O\text{—}CF_2\text{—}CFXH$$

wherein R^1, R^2 and R^3 denote hydrogen atoms or alkyl groups having 1 to 3 C atoms and X is Cl or F, by reacting alcohols of the formula

$$R^1HC{=}CR^2\text{—}CHR^3\text{—}OH$$

with fluoroolefins of the formula $CFX{=}CF_2$ wherein R^1, R^2, R^3 and X have the abovementioned meaning, in the presence of an alkali metal hydroxide as catalyst, which comprises carrying out the reaction in the presence of a substantially anhydrous N,N-dialkylcarboxylic acid amide of the formula



wherein R^4 denotes a hydrogen atom or an alkyl radical having 1 to 3 C atoms, R^5 and R^6 denote alkyl radicals having 1 to 3 C atoms or R^4 and R^5 together form a cyclic methylene bridge $—(CH_2)_y—$ in which y is 2 to 4, as the solvent, and with intimate mixing of the reactants.

4,433,181
PROCESS FOR RECOVERING A CRYSTALLIZATION MEDIUM

Samuel N. Holter, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 158,995, Jun. 12, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,537

Int. Cl.³ C07C 37/84

U.S. Cl. 568—750 **10 Claims**

1. A process to recover the crystallization medium for separating a 2,6-disubstituted phenol (DSP) from a feedstock containing it and a phenol in which only one of the 2 or 6 carbon positions is substituted (MSP), said process comprising:

(a) crystallizing said DSP from said feedstock with a water miscible, non solvent crystallization medium;

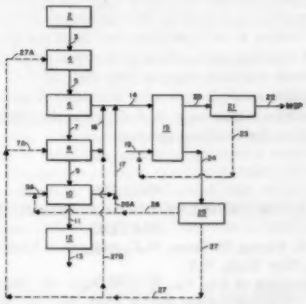
(b) separating the resultant DSP crystals from said crystallization medium and feedstock;

(c) washing said DSP crystals with crystallization medium;

(d) washing said DSP crystals with water;

(e) passing the wash water from (d) and the crystallization medium from (c) along with the crystallization medium and feedstock of (b) to an extraction means and extracting MSP with a water imiscible and crystallization medium immiscible extractant;

(f) stripping the extractant from the MSP of (e) and recycling the extractant for use in step (e); and



(g) separating water from the crystallization medium of step (e) and recycling the water for use in step (d) or (e) and recycling the crystallization medium for use in step (a), (c) or (e).

4,433,182
INSECTICIDAL 2,2'-BRIDGED[1,1'-BIPHENYL]-3-YLMETHYL ESTERS

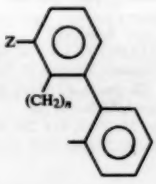
Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 259,111, Apr. 30, 1981. This application Dec. 17, 1981, Ser. No. 331,506

Int. Cl.³ C07C *33/34*

U.S. Cl. 568—808 **4 Claims**

1. 2,2'-Bridged[1,1'-biphenyl]-3-ylmethyl compounds of the formula



wherein Z is Y—CH_2— or R_1, and

(1) when Z is Y—CH_2—, n is 2–4, and Y is hydroxyl, and

(2) when Z is R_1, n is 2–4, and R_1 is lower alkoxycarbonyl; or n is 3–4, and R_1 is halogen, cyano, hydroxycarbonyl, or chlorocarbonyl.

4,433,183
PROCESS FOR THE PREPARATION OF (+)-P-MENTHA-2,8-DIEN-1-OL

Charles Fehr, Versoix, and Günther Ohloff, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Apr. 8, 1982, Ser. No. 366,553

Claims priority, application Switzerland, May 4, 1981, 2875/81

Int. Cl.³ C07C *35/14*

U.S. Cl. 568—829 **4 Claims**

1. Process for preparing (+)-(1S,4R)-p-mentha-2,8-dien-1-ol, which comprises

(a) epoxidizing (+)-(R)-limonene to yield a diastereomeric mixture of (+)-(1R,2S,4R)-1,2-epoxy-8-p-methene and (+)-1S,2R,4R)-1,2-epoxy-8-p-methene by means of an organic peracid;

(b) treating the above mixture with thiophenol in an inert organic solvent in the presence of sodium or potassium carbonate at a temperature near the boiling point of the selected solvent or mixture of solvents to yield (+)-(1S,2S,4R)-2-phenylthio-8-p-methene-1-ol after separation thereof from unreacted (+)-(1R,2S,4R)-1,2-epoxy-8-p-menthene;

(c) oxidizing the thus obtained 2-phenylthio-8-menthene into the corresponding sulfoxide, and

(d) heating (1S,2S,4R)-1-hydroxy-8-p-menthene-2-phenylsulfoxide of step (c) at a temperature comprised between about 400° C. and 450° C.

4,433,184
MULTI-STAGE CATALYTIC CONVERSION OF ALDOSES TO ALDITOLS

Derk T. A. Huibers, Pennington, N.J.; James C. Chao, West Nyack, N.Y., and Rajni C. Shah, Lawrenceville, N.J., assignors to HRI, Inc., Gibbsboro, N.J.

Filed Apr. 27, 1981, Ser. No. 258,225

Int. Cl.³ C07H *1/00*

U.S. Cl. 568—863 **18 Claims**

1. A multi-stage process for producing high-purity alditol solution by catalytic conversion of monosaccharides, comprising the steps of:

(a) preheating a feed of at least 10 W % monosaccharides solution in water and hydrogen gas to at least about 100° C., said feed having a pH of 7 to 13 and passing the heated feedstream mixture through multiple catalytic reaction zone connected in series, wherein each zone contains a particulate catalyst comprising high-activity nickel on an inert support;

(b) mixing an alkali solution with the feed stream to each reaction zone to maintain pH of the effluents of said reaction zones above about 4.5;

(c) maintaining the reaction zones at conditions within the range of 130°–180° C. temperature, 500–2000 psig hydrogen partial pressure, and 0.5–16 $V_v/hr/V_c$ space velocity, for achieving at least about 98 W % overall conversion of the monosaccharides feed to alditol; and

(d) withdrawing product containing substantially alditol in water solution.

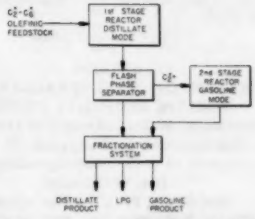
4,433,185
TWO STAGE SYSTEM FOR CATALYTIC CONVERSION OF OLEFINS WITH DISTILLATE AND GASOLINE MODES

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,705

Int. Cl.³ C07C *3/00, 3/03, 3/10, 3/62*

U.S. Cl. 585—312 **10 Claims**



1. A continuous process for converting an olefinic feedstock containing ethylene and C_3+ olefins by catalytic oligomerization to produce heavier hydrocarbons in the gasoline or distillate boiling range which comprises:

(a) contacting the olefinic feedstock in a first catalyst reactor zone with a crystalline zeolite oligomerization catalyst at elevated pressure and moderate temperature under conditions favorable for conversion of C_3+ olefins to a first

reactor effluent stream rich in distillate range hydrocarbons;

(b) flashing the distillate-rich stream and separating the first reactor effluent stream into a liquid stream rich in distillate and a vapor stream rich in ethylene;

(c) contacting the ethylene-rich stream from step (b) in a second catalyst reactor zone with a crystalline zeolite oligomerization catalyst at moderate pressure and elevated temperature under conditions favorable for conversion of ethylene and other lower olefins to a second reactor effluent stream rich in olefinic gasoline range hydrocarbons;

(d) reactionating effluent from the second reactor zone to recover a gasoline stream; and

(e) recycling at least a portion of the gasoline stream to the first reactor zone.

4,433,186

CATALYSTS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 449,913, Dec. 15, 1982. This application Jun. 2, 1983, Ser. No. 500,490

Int. Cl.³ C07C *5/32*

U.S. Cl. 585—445 **5 Claims**

1. A process for the dehydrogenation of para-ethyltoluene to selectively form para-methylstyrene, said process comprising contacting a feed comprising para-ethyltoluene and steam under steam dehydrogenation reaction conditions with a catalyst composition comprising:

a. from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

b. from about 13% to 48% by weight of potassium compound, calculated as potassium oxide;

c. from about 0% to about 5% of chromium compound, calculated as chromic oxide; and

d. from about 1% to 15% by weight of a gallium compound, calculated as gallium trioxide.

4,433,187

PROCESS FOR SELECTIVELY PRODUCING PARA-XYLENE

Dean A. Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 12,868, Feb. 16, 1979, Pat. No. 4,270,017. This application Jun. 9, 1980, Ser. No. 157,211

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—466 **18 Claims**

1. A process for selectively preparing para-xylene which comprises contacting toluene with a methylating agent, under methylation conditions, in the presence of a phosphorus-modified catalyst comprising a silica polymorph in combination with an inorganic refractory oxide, said catalyst having an alkali content of less than about 1.3 milliequivalents per gram as available alkali.

4,433,188

PREPARATION OF OLEFINS FROM METHANOL AND/OR DIMETHYL ETHER

Wolfgang Hoelderich; Wolf D. Mross, both of Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Del.X Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,814

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135618

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—640 **10 Claims**

1. A two-stage process for the preparation of lower olefins from methanol and/or dimethyl ether by catalytic conversion at from 300°–550° C. in the presence of zeolite catalysts, wherein the selectivity for C_5^+ hydrocarbons is suppressed and the overall selectivity for C_1–C_4 hydrocarbons is optimized, which comprises; reacting methanol and/or dimethyl ether over borosilicate zeolite catalyst at from 300°–550° C. in a first reaction stage, removing C_2 and C_3 olefins after the first reaction stage in a working-up stage as gas, passing the remaining C_4 olefins, C_1–C_4 paraffins and liquid reaction mixture to a second reaction stage, reacting the remaining hydrocarbons in the second reaction stage at from 300°–550° C. over borosilicate zeolite catalyst, removing aromatics from the product of the second reaction stage, and recycling the remaining reaction product to the working-up stage.

4,433,189

CATALYTIC CONVERSION OF METHANOL TO LIGHT OLEFINS

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 359,559, Mar. 18, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 501,963

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—640 **11 Claims**

1. A process for producing a hydrocarbon mixture containing light olefins by contacting a methanol feed with a catalyst consisting essentially of a bound or unbound crystalline aluminosilicate zeolite having a Constraint Index of about 1 to 12 and a silica to alumina molar ratio of at least about 12, said catalyst not being modified by incorporation of essentially any material other than binder into or onto the zeolite, said contacting occurring in a reaction zone under methanol conversion reaction conditions, said process comprising:

co-feeding to said reaction zone along with said methanol feed a diluent which provides in said reaction zone an O_2-containing gas in an amount sufficient to increase the selectivity of the conversion reaction for production of C_2 to C_4 olefins, said amount of O_2-containing gas being further sufficient to provide a molar ratio of molecular oxygen to methanol of from about 0.01:1 to 0.25:1.

4,433,190

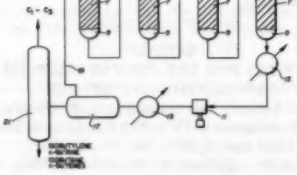
PROCESS TO CONVERT LINEAR ALKANES

David L. Sikkenga, Wheaton; Thomas D. Nevitt, Naperville, and Norman F. Jerome, Elmhurst, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 24, 1982, Ser. No. 422,821

Int. Cl.³ C07C *5/124, 5/30, 5/36, 5/40*

U.S. Cl. 585—660 **28 Claims**



1. A process to convert a substantially linear alkane to dehydrogenated and isomerized products comprising contacting such alkane under conversion conditions comprising a temperature of about 250° to about 650° C., a pressure of about 0.1 to about 50 atmospheres, a hydrogen/hydrocarbon molar ratio of 0 to about 10 and a weight hourly space velocity of about 0.1 to about 40 hr^{-1} with an AMS-1B crystalline borosilicate-based catalyst composition containing an ion or molecule of a noble metal.

4,433,191

SKELETAL ISOMERIZATION OF N-ALKENES

Antonio E. Eleazar, Freehold; Ronald M. Heck, Frenchtown; Joseph C. Dettling, Howell Township, Monmouth County, and Yiu-Kwan Lui, Parlin, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Sep. 30, 1982, Ser. No. 430,297
Int. Cl.³ C07C 5/28, 5/30
U.S. Cl. 585—671 10 Claims

1. A method for converting a linear isomerizable olefin to its branched isomers, comprising, passing the linear olefin in admixture with its paraffinic analogue throught a vessel containing an isomerization catalyst consisting essentially of a Group VIII metal on an activated alumina base, and a halide absorbed thereon at a pressure and at a temperature sufficient to convert at least 15% of the linear olefin to its skeletal isomer.

4,433,192

CONDENSATION OF NATURAL GAS OR METHANE INTO GASOLINE RANGE HYDROCARBONS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Filed Sep. 1, 1981, Ser. No. 298,486
Int. Cl.³ C10L 1/16
U.S. Cl. 585—709 4 Claims

1. A process for the heterogeneous gas-phase condensation of natural gas or methane into gasoline-range hydrocarbons comprising the steps of:

(a) pretreating the natural gas or methane by catalytic dehydrogenation at a temperature between 50° and 250° C. to form a mixture of methane and lower olefins in the C_2 to C_6 range;

(b) condensing the resulting mixture of methane and lower olefins at a temperature between 50° and 250° C. in the presence of a superacid catalyst having a Hammett acidity function H_0 less than −11.9 to form hydrocarbon mixtures in the gasoline range.

4,433,193

PROCESS FOR THE PRODUCTION OF ETHANE

Paul E. Koppel, Lexington; Joseph J. Williams, Sudbury, both of Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Oct. 16, 1981, Ser. No. 312,157
Int. Cl.³ C07C 9/06; C10G 47/22
U.S. Cl. 585—752 17 Claims

1. A process for the production of ethane comprising:

(a) introducing a feedstock comprising mainly aromatic hydrocarbons and hydrogen into a non-catalytic reactor zone, the amount of hydrogen being between 1 and 4 times the stoichiometric requirement to convert all carbon in said feedstock into methane;

(b) reacting said feedstock at a temperature between 1100° and 1600° F. and pressure between 300 and 2500 psia for less than 240 seconds;

(c) discharging the resultant ethane-containing reaction product from said zone; and

(d) immediately cooling said product.

4,433,194

PURIFICATION OF CYCLOHEXANE

Ted Symon, Lombard, and Dusan J. Engel, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 6, 1983, Ser. No. 492,306
Int. Cl.³ B01D 3/34; C10G 29/12; C07C 17/38, 21/00
U.S. Cl. 585—803 8 Claims

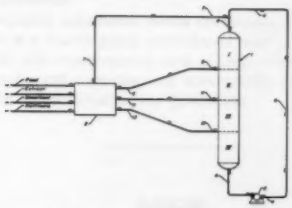
1. A method for the purification of cyclohexane which comprises treating said cyclohexane with titanium tetrachloride, contacting said treated cyclohexane with an adsorbent, subjecting said cyclohexane to fractional distillation in the presence of a purification agent comprising an alkali metal borohydride or aluminum hydride to remove contaminants therefrom, and recovering the purified cyclohexane.

4,433,195

SEPARATION OF TRANS- AND CIS-OLEFINS

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 2, 1983, Ser. No. 471,397
Int. Cl.³ C07C 7/12
U.S. Cl. 585—820 22 Claims



1. A process for separating a trans-olefin from a feed containing a trans-olefin and a cis-olefin, comprising contacting said feed at adsorption conditions with an adsorbent comprising silicalite to effect selective adsorption of said trans-olefin and removing said cis-olefin from contact with said trans-olefin containing adsorbent.

4,433,196

COLOR PRECURSOR REMOVAL FROM DETERGENT RANGE ALKYL BENZENES

Kang Yang, and James D. Reedy, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 25, 1982, Ser. No. 392,431
Int. Cl.³ B01D 15/00
U.S. Cl. 585—823 10 Claims

1. A method for removing precursors causing color in sulfonated alkyl benzene from said alkyl benzene prior to sulfonation comprising contacting non-sulfonated alkyl benzenes with a solid adsorbent to remove said precursors, where said adsorbent is at least one material selected from the group consisting of (1) bauxite clays containing from about 0.1 to about 20% by weight of at least one material selected from the group consisting of ferric oxide, titanium dioxide, and zirconium oxide, said clay contacted with from about 0.1 to about 20% by weight of sulfuric acid, then activated for removal of color precursors by calcining the mixture at a temperature and time sufficient to activate the adsorbent prior to use, and (2) crystalline zeolites suspended in a silica alumina matrix, wherein said adsorbent contains from about 5% to about 20% by weight of zeolite, based on the total weight of the adsorbent, and then activated for removal of color precursors by calcining the mixture at a temperature and time sufficient to activate the adsorbent prior to use.

4,433,197

REMOVING BORON TRIFLUORIDE FROM COORDINATION COMPOUND CONTAMINANTS IN ORGANIC LIQUIDS

Roger F. Vogel, Jefferson Township, Butler County, Pa.; Ajay M. Madgavkar, Irvine, Calif., and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 8, 1982, Ser. No. 396,256
Int. Cl.³ C07C 7/12, 3/18
U.S. Cl. 585—823 8 Claims

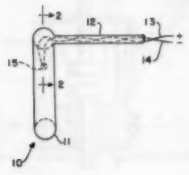
1. A method for removing boron trifluoride from a coordination compound of boron trifluoride and an organic polar compound present as a minor contaminant in a hydrocarbon liquid which comprises contacting a particulate silica composition with a hydrocarbon liquid contaminated with said coordination compound of boron trifluoride and an organic polar compound whereby the boron trifluoride is separated from said organic polar compound out of the coordination compound and out of the hydrocarbon liquid by the silica and said separated organic polar compound remains in the hydrocarbon liquid.

4,433,198

DEVICE TO MEASURE TEMPERATURE OF AN ANNULAR ELASTOMERIC SEAL

William E. Berner, Englewood, and Thomas H. Wical, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1982, Ser. No. 366,742
Int. Cl.³ H01L 35/02
U.S. Cl. 136—230 4 Claims



1. An improved reciprocating seal, including an annular elastomeric seal in combination with a device for measuring the temperature of said annular elastomeric seal, which comprises:

a. a thermocouple, having a pair of electrically conducting wires connected thereto, embedded within and near the center of the annular body of said elastomeric seal; and

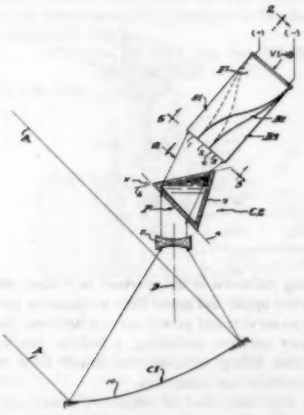
b. a sleeve having a first end thereof terminating within and molded to said elastomeric seal near said thermocouple, said sleeve enclosing said conducting wires.

4,433,199

SOLAR INSOLATION AND CONCENTRATION BY COUPLED FIBER OPTICS

Gerald W. Middy, 938 20th St., Santa Monica, Calif. 90403

Filed Jun. 17, 1982, Ser. No. 389,440
Int. Cl.³ H01L 31/04
U.S. Cl. 136—246 8 Claims



1. Solar insolation and power generation means which includes:

a primary concentrator means comprising a linear parabolic reflector projecting a narrowed band of light through a first plane,

a secondary concentrator means comprising, in combination, a prism disposed to receive said narrowed band of light through said first plane and by refraction projecting said light in the form of a spectrum of substantially monochromatic areas of light from a second plane and through a third source plane, and a plurality of bundles of fiber optic light pipes having source ends aligned at said third source plane with a substantially monochromatic area of light and arranged in pairs of bundles coupled into single bundles thereof by means of bifurcated couplings therefor and having light concentrating ends remote from said source ends,

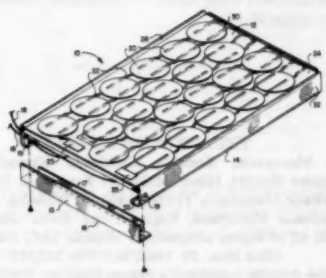
and a power generation means comprising a photo voltaic cell at a fourth plane coincidental with and coextensive with said concentrating ends of each of said plurality of bundles and receiving said substantially monochromatic light for electrical power generation.

4,433,200

ROLL FORMED PAN SOLAR MODULE

Theresa L. Jester, Palmdale; John W. Yerkes, Chatsworth; Charles F. Gay, Northridge, and William R. Bottenberg, Thousand Oaks, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 2, 1981, Ser. No. 307,912
Int. Cl.³ H01L 31/04
U.S. Cl. 136—251 9 Claims



1. A solar cell module comprising:

a metal substrate formed from a single sheet of material having a generally rectangular planar central portion having upper and lower surfaces, upturned flanges extending essentially at right angles from edges of said upper surface, downturned flanges extending from at least two opposed upturned flanges at substantially right angles to said central portion and extending beyond said lower surface,

a first pottant sheet covering and supported by said upper surface,

a plurality of solar cells positioned on said first pottant sheet,

a second pottant sheet covering and supported by said circuit and said first pottant sheet,

a substantially transparent superstrate covering said second pottant sheet, and

terminals extending through said metal substrate to provide external connections to said circuit,

wherein said upturned flanges extend above said upper surface by a distance about equal to the combined thicknesses of said first and second pottant sheets, said circuit and said superstrate, and

wherein said first and second pottant sheets are fused together and fill substantially all space between said substrate, said solar cells and said superstrate, and also fill the space between the edges of said superstrate and the inner surfaces of said upturned flanges to form a weatherproof seal around edges of said module.

4,433,201

SOLAR POWER ARRAYS FOR SPACECRAFT

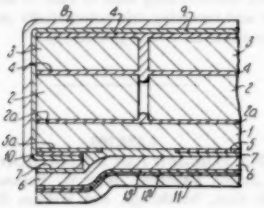
Christakis N. Fellas, Hatfield, England, assignor to British Aerospace Public Limited Company, London, England

Filed May 3, 1982, Ser. No. 374,022

Claims priority, application United Kingdom, May 2, 1981, 8113615

Int. Cl.³ H01L *31/04*

U.S. Cl. 136—251 **6 Claims**



1. A solar cell power generating array for a spacecraft having a protective cover sheet over a surface portion of the array, the cover comprising an outer layer of flexible transparent plastics material and a layer, nearer the said array surface portion than said outer layer, of transparent, electrically conductive material.

4,433,202

THIN FILM SOLAR CELL

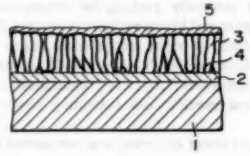
Eiichi Maruyama, Kodaira; Toshikazu Shimada, Tokyo; Yasuhiro Shiraki, Hino; Yoshifumi Katayama, Tokorozawa; Hirokazu Matsubara, Tokyo; Akitoshi Ishizaka, Kokubunji; Yoshimasa Murayama, Koganei, and Akira Shintani, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,115

Claims priority, application Japan, Mar. 30, 1981, 56-45554

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 **12 Claims**



1. A thin film silicon solar cell formed on a substrate, comprising:

a layered structure disposed on the substrate, including at least a first electrode, a thin film comprising silicon formed on said first electrode, and a second electrode formed on said silicon thin film, at least one of said first and second electrodes being transparent, and said structure including at least one barrier layer or junction for separating photo-ionized carriers,

wherein the silicon thin film comprises a mixed phase of polycrystalline phase and a substantially terminated amorphous phase and includes at least about 50% by volume of fibrous crystalline grains, each of which has a bottom diameter of not larger than 1 μm and a height of at least 50 nm, and has its grain boundaries substantially terminated.

5. A thin film silicon solar cell as set forth in claims **1** or **2**, wherein said junction comprises a PIN junction.

4,433,203

ELECTRICAL INSULATOR WITH WATER-REPELLENT OIL-BLEEDING INSULATION BANDS

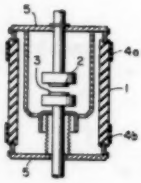
Kunihiko Takagi, Tama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 24, 1982, Ser. No. 423,292

Claims priority, application Japan, Oct. 15, 1981, 56-163430

Int. Cl.³ H01B *17/50*; H01H *33/66*

U.S. Cl. 174—30 **7 Claims**



1. An electrical insulator having a substantially cylindrical outer peripheral surface and having a plurality of water-repellant oil-bleeding insulation bands disposed on said outer surface.

4,433,204

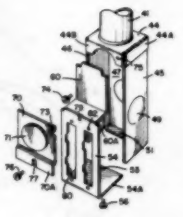
JUNCTION BOX FOR POKE-THRU FLOOR FITTINGS

Emil S. Wuertz, Madison, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Aug. 9, 1982, Ser. No. 406,177

Int. Cl.³ H02G *3/08*

U.S. Cl. 174—48 **11 Claims**



1. In a fitting mounted in an aperture in a floor structure having respective upper and lower floor surfaces for providing communications service and power service between the lower and upper floor surfaces including, a hollow junction box mounted on the fitting adjacent the lower floor surface, wherein the junction box comprises:

a first side wall comprised of respective upper and lower exterior covers detachably mounted on the box in adjacent relationship and a second side wall opposite said first side wall;

a divider member in said box for separating the communications service conductors from the power service conductors, said divider member extending laterally from the lower cover toward said second side wall and upwardly in said box opposite the upper cover to provide two partitioned compartments for the communications and the power service conductors, respectively.

4,433,205

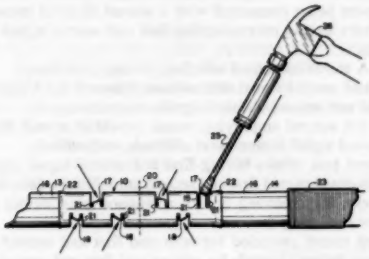
COMPRESSIVE CABLE CONNECTOR

John E. Summers, P.O. Box 5433, Charlotte, N.C. 28225

Continuation-in-part of Ser. No. 31,423, Apr. 19, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 238,738

Int. Cl.³ H01R 4/20

U.S. Cl. 174—84 C **2 Claims**



1. A cable connector for joining together two ends of malleable metal cable, said cable connector comprising a sleeve formed from malleable metal and having an axis and a smooth inner surface, said sleeve including a plurality of deformable portions formed in axially spaced relation to each other on one side of the axis of the sleeve and defined along the corresponding surface of the sleeve by slots extending radially from said corresponding surface of the sleeve toward the axis of the sleeve at the axially spaced margins of their respective deformable portions; whereby the two ends of cable may be pushed into opposite ends of the sleeve toward abutting relation with each other and subjacent the series of deformable portions, after which the deformable portions of the sleeve and the malleable metal cable subjacent thereto may be reoriented inwardly toward the axis of the sleeve.

4,433,206

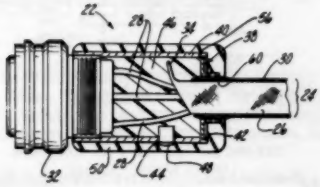
EMI SHIELDED CONNECTOR ASSEMBLY

John Lewis, Binghamton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1981, Ser. No. 329,154

Int. Cl.³ H01R 13/658

U.S. Cl. 174—356 **5 Claims**



1. An EMI shielded connector assembly comprising a cable connector body, a cable having at least a first cover overlying jacketed wires and terminating in a braided tail, a second braided cover overlying the first cover, the jacketed wires extending beyond the first and second covers and inserted in the connector body; and a back-shell receiving the cable at one end and pressed fit to the connector body at the other end, the back-shell having an aperture therein adapted to receive potting compound within the shell; characterized by

a ferrule member encircling the cable between the first cover and the second cover;

a ferrule clamping member compressing the second cover to said ferrule member forming an interference fit;

means securing said ferrule clamping member to the back-shell;

potting compound filling the interior of the back-shell and securing the tail of the first cover and the jackets of the wires therein; and

means closing the aperture and with the back-shell and said ferrule clamping member forming an EMI shield over the cable and connector body.

4,433,207

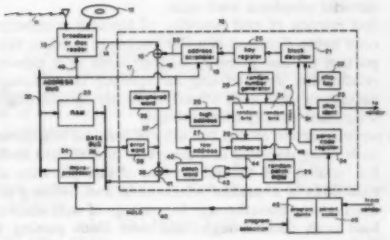
CRYPTOGRAPHIC DECODER FOR COMPUTER PROGRAMS

Robert M. Best, 16016 Ninth Ave. Northeast, Seattle, Wash. 98155

Filed Sep. 10, 1981, Ser. No. 300,797

Int. Cl.³ H04L 9/00

U.S. Cl. 178—22.09 **17 Claims**



14. A cryptographic apparatus for deterring unauthorized execution of computer programs of instructions stored in enciphered form as a plurality of portions of enciphered information, the apparatus comprising:

means for deciphering an enciphered program key as a function of a secret chip key to produce a deciphered program key corresponding to a selected program;

means for deciphering portions of said enciphered information as a function of said deciphered program key to produce deciphered instructions in said selected program;

table means for storing a plurality of digital addresses and a corresponding plurality of multiple-bit digital words;

means for determining whether a memory address matches one of the digital addresses in said table means;

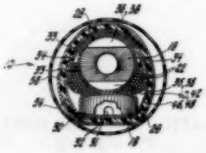
means for reenciphering a plurality of said deciphered instructions or portions thereof to produce reenciphered instructions to be stored at memory locations specified by memory addresses, the reenciphering being performed on an instruction or portion thereof if said determining means determines that the memory address of the instruction matches one of the digital addresses in said table means, the reenciphering being a function of the digital word in said table means corresponding to the matching digital address; and

means for redeciphering one of said reenciphered instructions whenever the instruction is fetched for execution from a memory location specified by a memory address matching one of the digital addresses in said table means, the redeciphering being performed as a function of the digital words in said table means corresponding to the digital address that matches the memory address of the instruction, thereby restoring reenciphered instructions to unenciphered form during execution of said selected program.

4,433,208
PRESSURIZABLE TELEPHONE LOAD COIL ASSEMBLY

David C. Noetzelmann, Sr., Minatare, Nebr., assignor to Midwec Toroid & Capacitor Corporation, Rolling Meadows, Ill.

Filed Aug. 27, 1981, Ser. No. 296,678
Int. Cl.³ H01F 17/08, 27/04, 15/02
U.S. Cl. 178—46 13 Claims

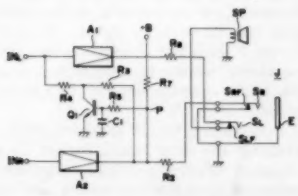


6. A pressurizable telephone load coil assembly, comprising:
a section of pressurizable telephone cable having a plurality of conductors;
said conductors being electrically connected to a plurality of toroidal telephone load coils;
a first portion of said plurality of toroidal telephone load coils being disposed in a flat enclosure holding said first portion of said plurality of load coils in a side-by-side relationship and defining an opening therethrough for passage of wire leads of said load coils therethrough, said wire leads passing therethrough;
a second portion of said plurality of toroidal telephone load coils being disposed in a generally tube-shaped enclosure for holding said second portion of said plurality of said load coils in a stacked relationship and defining at least one opening therethrough for passage of wire leads of said load coils therethrough, said wire leads passing therethrough;
binding means disposed around said flat enclosure and said generally tube-shaped enclosure for holding said enclosures in a parallel relationship to form a load coil package;
a heat shrinkable tube having a first closed end and second open end disposed around said load coil package;
said second open end being shrunk by heating to conform to said section of pressurizable telephone cable and to form an airtight seal thereto.

4,433,209
STEREO/MONAURAL SELECTING CIRCUIT

Nobuyuki Kurosawa, Yokohama, and Kazuaki Suda, Asaka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,392
Claims priority, application Japan, Apr. 25, 1980, 55-56801[U]
Int. Cl.³ H04S 7/00
U.S. Cl. 381—1 19 Claims



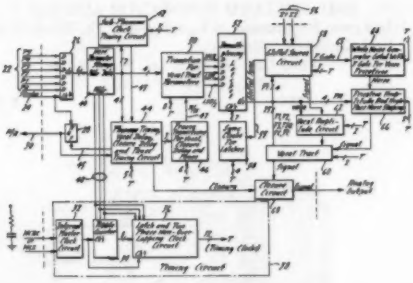
1. A stereo/monaural selecting circuit comprising:
first and second signal transmission channels for transmitting first and second signals, respectively;
first and second amplifier means provided in said first and second transmission channels, respectively;
a first binaural connecting device having first and second signal terminals connected to said first and second amplifier means, respectively;
mixing means provided between said first and second signal transmission channels to mix said first and second signals; and
controlling means including transistor means connected to said mixing means for automatically rendering said mixing means inoperative in response to said first binaural connecting device being connected with a second binaural connecting device having corresponding first and second signal terminals.

7. A stereo/monaural selecting circuit comprising:
first and second signal transmission channels for transmitting first and second channel signals, respectively;
first and second amplifying means provided in said first and second signal transmission channels, respectively;
binaural jack means having first and second signal terminals connected to said first and second amplifying means, respectively; for receiving one of a binaural plug device and a monaural plug device;
mixing means provided between said first and second signal transmission channels for mixing said first and second channel signals; and
control means connected to said mixing means for automatically rendering said mixing means inoperative in response to when a said binaural plug device having corresponding first and second signal terminals being connected with said binaural jack means.

4,433,210
INTEGRATED CIRCUIT PHONEME-BASED SPEECH SYNTHESIZER

Carl L. Ostrowski, Mt. Clemens, Mich., and Bertram White, Tustin, Calif., assignors to Federal Screw Works, Detroit, Mich.

Continuation of Ser. No. 156,483, Jun. 4, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,356
Int. Cl.³ G10L 1/00
U.S. Cl. 381—53 12 Claims



1. In a phoneme-based speech synthesizer including parameter storage means for producing, for each phoneme, on a first data bus a plurality of multiplexed digital control parameters defining target values for said control parameters, and a vocal tract model that is controlled in accordance with the current values of said control parameters; the improvement comprising digital transition means for sequentially transitioning said control parameters so that the values of said control parameters are gradually changed from said current values toward said target values, including:
output means for providing on a second data bus the multiplexed current values of said control parameters;
demultiplexer means for demultiplexing the signal on said second data bus and producing a corresponding plurality of parallel digital output signals comprising the current values of said plurality of control parameters; and

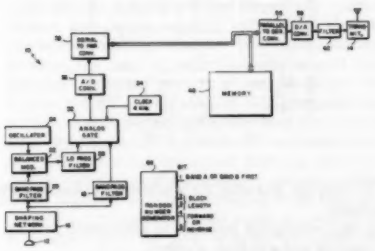
arithmetic circuit means for calculating a factor related to a predetermined percentage of the difference between the target value signal on said first data bus and the current value signal on said second data bus, adding said factor to said current value signal at a predetermined rate, and providing the resulting value signal to said output means.

4,433,211

PRIVACY COMMUNICATION SYSTEM EMPLOYING TIME/FREQUENCY TRANSFORMATION

Arnold M. McCalmont, Acton, and Matthew W. Slate, Sudbury, both of Mass., assignors to Technical Communications Corporation, Concord, Mass.

Filed Nov. 4, 1981, Ser. No. 317,947
Int. Cl.³ H04K *1/06*; H04L *9/00*
U.S. Cl. 179—1.5 S **24 Claims**



1. A privacy communication system comprising

A. means for splitting a voice signal into a selected number of frequency bands;

B. means for generating a pseudo-random key word;

C. means for dividing each said band into segments of different time duration in accordance with the pseudo-random key word;

D. means for compressing said segments in time and expanding them in frequency by a factor equal to the number of frequency bands into which the voice signal was divided; and

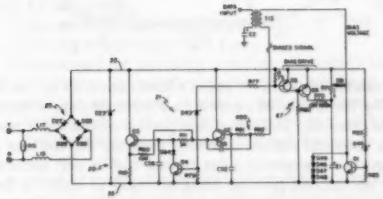
E. means for transmitting said time-compressed segments, the transmitted signal having substantially the same time-bandwidth product as the voice signal.

4,433,212

TELEPHONE LINE INTERFACE CIRCUIT

Donald W. Moses, Minneapolis, Minn.; Charles Hustig, Hudson, Wis., and C. Ray Ballard, Venice, Fla., assignors to Applied Spectrum Technologies, Inc., Minneapolis, Minn.

Filed Jun. 21, 1982, Ser. No. 390,183
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—2 C **15 Claims**



1. A communications medium interface circuit which couples data to a telephone line having at least one telephone connected thereto during all normal operating conditions of the line comprising:

a first transistorized output state connected to the telephone line having a low bridging impedance operative when the associated telephone connected to the telephone line is off-hook;

a second transistorized output stage connected to the telephone line having a high bridging impedance operative when the associated telephone connected to the telephone line is on-hook; and

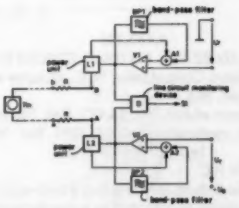
means connected to the telephone line and operatively connected to each of the output stages for sensing when the associated telephone is on-hook or off-hook and for switching the circuit between the first output stage and the second output stage in response to the condition of the telephone line such that data is operably coupled to the telephone line by the first stage when the telephone is off-hook and the data is operably coupled to the telephone line by the second stage when the telephone is on-hook.

4,433,213

SUBSCRIBER'S LINE CIRCUIT FOR TELECOMMUNICATIONS NETWORKS

Raymund Albers, Eckental, and Hans G. Widder, Nuremberg, both of Fed. Rep. of Germany, assignors to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,779
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104138
Int. Cl.³ H04M *1/76, 19/00*
U.S. Cl. 179—18 FA **8 Claims**

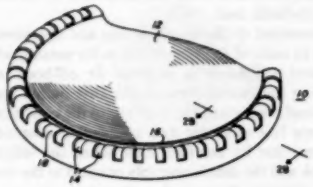


1. A line circuit for telecommunications networks, particularly for telephone networks, comprising at least one user line loop connected to a terminal station; two sources of constant current arranged symmetrically to the terminal station in the user line loop for keeping current in the loop constant irrespective of the length of the loop; each of said current sources comprising a power unit having a power output connected to the terminal station, a feedback output for delivering a regulating signal which may contain interference signal components, and a control input; a differential amplifier defining an output, a non-inverting input and an inverting input, the output of said differential amplifier being connected to the control input of the power unit; an adder having an output and two inputs, the output of said adder being connected to the inverting input of the amplifier, one of the inputs of the adder being connected to the feedback output of the power unit; a source of reference voltage connected to the non-inverting input of the amplifier; and a bandpass filter connected between said control input of the power unit and the other input of said adder to pass through the frequency band of interference signals at an opposite phase than the interference signal components from the feedback output of said power unit.

4,433,214
ACOUSTICAL TRANSDUCER WITH A SLOTTED PISTON SUSPENSION

Leon Jasinski, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 24, 1981, Ser. No. 334,391
Int. Cl.³ H04R 9/00, 9/04
U.S. Cl. 179—115.5 ES 14 Claims



1. An improved unified piston suspension assembly for utilization of an electrodynamic acoustical transducer, the piston suspension assembly comprising in combination:

a curved center sound radiating dome;

a curved piston suspension of resilient plastic material, the suspension formed from the same piece of resilient material as the curved centered sound radiating dome;

said curved piston suspension having stress-relieving elongated slots integral therein, each of said stress-relieving slots having a predetermined reduced thickness relative to the thickness of the surrounding piston suspension and being positioned at predetermined intervals along the circumference of said piston suspension,

said suspension defining means for relieving certain bending stresses experienced along the radii of the curved sound radiating dome and certain perpendicular concentric stresses during the operation of the associated electrodynamic acoustical transducer.

4,433,215
SOLID STATE HYBRID CIRCUITS

Donald W. Wortman, Central Islip, N.Y., assignor to TII Corporation, Copeague, N.Y.

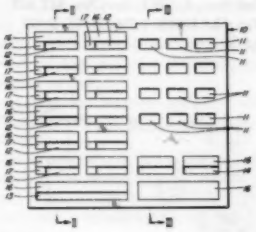
Continuation-in-part of Ser. No. 15,407, Feb. 26, 1979, Pat. No. 4,278,847. This application Jul. 10, 1981, Ser. No. 282,056
Int. Cl.³ H04B 1/58
U.S. Cl. 179—170 NC 13 Claims

1. An electronic hybrid for coupling a two-wire signal transmission line to a signal source and to a signal-receiving load in a communication system, said electronic hybrid comprising a two-wire port adapted to be electrically connected to said two-wire line for receiving incoming differential information signals from said line, a signal transmit port adapted to be electrically connected to said signal-receiving load, a signal receive port adapted to be electrically connected to said signal source for receiving signals from said source, means connected intermediate said two-wire port and said transmit port for converting the received incoming differential information signals into first single-ended signals and for applying said single-ended signals to said transmit port for transmission to said signal-receiving load, first and second transistors, means for applying second single-ended signals received at said receive port to said first transistor, means electrically connected to and cooperating with said first and second transistors for converting the second single-ended signals applied to said first transistor into outgoing balanced differential signals each having one signal component on a preselected electrode of said first transistor and the other signal component on a preselected electrode of said second transistor, said preselected electrodes of said first and second transistors being electrically connected to said two-wire port for applying the outgoing differential signal thereto for transmission over said line, and further means electrically connected to said first and second transistors for maintaining a high a.c. output impedance on said preselected electrodes of said transistors.

4,433,216
FACEPLATE ASSEMBLY FOR TELECOMMUNICATIONS TERMINALS AND OTHER TERMINALS

Robert B. Isaacs, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 12, 1982, Ser. No. 357,776
Int. Cl.³ H04M 1/02
U.S. Cl. 179—178 7 Claims



1. A faceplate assembly for a telecommunications terminal, comprising:

two flat rectangular members in superposed position, a top member and a bottom member;

a plurality of apertures in each member, the apertures in one member aligned with the apertures in the other member;

a plurality of window areas in said top member, each window area associated with and adjacent to an aperture;

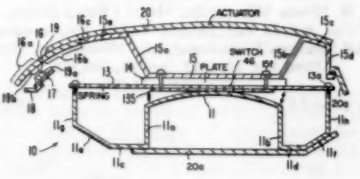
means defining a plurality of channels between the top and bottom members, each channel extending to an edge of the faceplate assembly and open at said edge for insertion and removal of a card;

each channel extending below at least one window area.

4,433,217
HAND CONTROLLER MULTIPLE CIRCUIT SWITCH

William M. Griffith, Menlo Park, Calif., assignor to Koala Technologies Corporation, Santa Clara, Calif.

Filed Aug. 16, 1982, Ser. No. 408,328
Int. Cl.³ H01H 13/70, 3/00, 25/00; A63F 7/06
U.S. Cl. 200—5 R 6 Claims



1. An electrical switch for use in a hand controller for use in controlling the motion of a cursor on a video display, wherein said hand controller includes a first portion containing a portion of a spherical surface convexly mounted thereon and a second portion containing a flat surface over a part thereof, said first and second portions being arranged so that said flat surface on said second portion is capable of being rocked over said portion of a spherical surface on said first portion, and includes deflectible spring means extending between said first and second portions for restoring said first and second portions

to their nominal positions in the absence of a disturbing force applied thereto;

wherein said electrical switch means is mounted on the bottom of said flat plate between said flat plate and said portion of a spherical surface and wherein said electrical switch means comprises:

a top portion attached to said flat plate, said top portion comprising a substantially flat sheet of insulative material containing thereon a first electrically conductive surface at all points on the side not facing said flat plate except a portion in the middle thereof at said nominal positions of said first and second portions;

a bottom portion beneath said top portion containing thereon on the side facing said top portion a second electrically conductive surface, wherein said second electrically conductive surface has an outer periphery of substantially the same shape as the outer periphery of said first electrically conductive surface and wherein said second electrically conductive surface is arranged to lie directly beneath said first electrically conductive surface, and further wherein said second electrically conductive surface contains four triangular-shaped portions, the base of each triangular shaped portion abutting a selected portion of the periphery of said bottom portion and the sides of each triangular shaped portion intersecting said periphery such that each triangular-shaped portion is electrically separated from the two adjacent triangular-shaped portions; and wherein said second electrically conductive surface includes:

selected conductive fingers extending from each of said sides of said triangular-shaped portions toward but not in contact with the two adjacent triangular-shaped portions such that the fingers extending from one triangular-shaped portion to an adjacent triangular-shaped portion are interdigitated with the fingers extending from the adjacent triangular-shaped portion to the one triangular-shaped portion; and

an annular band of insulative material separating the outer periphery of said first electrically conductive surface from said second electrically conductive surface with an air space formed between said first electrically conductive surface and said second electrically conductive surface such that said first electrically conductive surface is not in contact with said second electrically conductive surface except in response to rocking pressure applied to said flat plate, whereby rocking movement of said flat plate and resultant contact with said spherical surface between said first and second electrically conductive surfaces activates the switch means at that position.

4,433,218

ELECTRICAL INSTRUMENT WITH REMOVABLE CALIBRATING KNOB

Amede R. Provencher, Marlboro, Mass., assignor to Kidde, Inc., Clifton, N.J.

Filed Aug. 17, 1981, Ser. No. 293,449
Int. Cl.³ H01H *19/00*; G05G *1/10*
U.S. Cl. 200—11 R **10 Claims**

1. An electrical instrument comprising:

a housing comprising a face plate;

a component for providing a variable electrical characteristic, said component being retained by said housing;

a shaft having one end coupled to said component and rotatable to vary said electrical characteristics, said shaft extending through said face plate and having an opposite end adjacent thereto;

a coupling means attached to said opposite end of said shaft, said coupling means and said shaft being shaped and arranged to permit only one given relative angular position therebetween and to prevent relative rotational movement therebetween while allowing relative axial movement therebetween during removal of said coupling means from said shaft;

a knob attached to said coupling means, said knob and said coupling means being shaped and arranged to allow both relative axial and rotational movement therebetween;

a locking means activatable to prevent said relative movement between said knob and said coupling means so as to permit removal of said knob and couling from said shaft as a unit and to insure the repositioning thereof in said given relative angular position upon replacement of said unit on said shaft; and

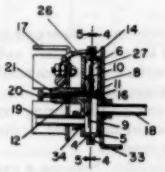
a scale located on said face plate adjacent to said knob so as to indicate the relative angular position thereof.

4,433,219

DIFFERENTIAL PRESSURE SWITCH WITH SQUARE DIAPHRAGM PLATE SUPPORTED BY THE DIAPHRAGM

Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530

Filed Feb. 22, 1982, Ser. No. 350,820
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 R **3 Claims**



1. A differential switch comprising:

a housing including a pair of housing sections clamped together and formed to define between them an essentially square diaphragm chamber of restricted depth,

an essentially square diaphragm of compliant material clamped between said housing section in fluid tight seal relation about said chamber,

an essentially square diaphragm plate anchored to one side of said essentially square diaphragm and in juxtaposition thereto,

an essentially square diaphragm plate formed with projections to limit movement of said diaphragm plate with respect to said housing,

said essentially square diaphragm plate formed with a recessed boss to accept a compression spring,

said compression spring is connected to an adjustment screw threadedly mounted in said housing,

said adjustment screw is locked exteriorly of said housing with a torque nut,

said essentially square diaphragm plate has formed projecting rivets for anchoring said essentially square diaphragm,

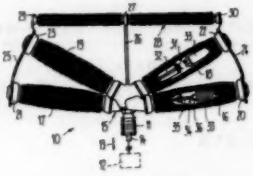
electrical connection, and electrical contact in juxtaposition thereto,
said electrical contact is normally in contact with an adjacent said electrical contact anchored to the housing,
said electrical contact is provided with means for connecting to a terminal on abutments of said housing,
said adjacent electrical contact is provided with means for connecting to an adjacent terminal on abutments of said housing,
said housing sections have means for connecting the portions of said chamber on either side of said diaphragm to differential gas pressure sources,
said spring being proportioned to normally hold said electrical contact in engagement with said adjacent electrical contact in one position of said spring,
whereby, as pressure differentials on either side of said diaphragm increase, the spring changes and said electrical contact becomes disengaged from the said adjacent electrical contact.

4,433,220

HIGH-VOLTAGE CIRCUIT BREAKER

Anton Bühler, Triengen, and Peter Hug, Safenwil, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Mar. 15, 1982, Ser. No. 358,217
Claims priority, application Switzerland, Apr. 22, 1981, 2618/81
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **8 Claims**



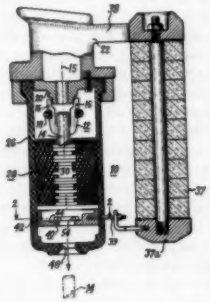
1. A high-voltage circuit breaker comprising:
means defining at least one primary switch position;
means defining a series circuit of an auxiliary switch position containing a cut-on resistor;
said primary switch position being connected in parallel with said series circuit of said auxiliary switch position and said cut-on resistor;
a drive rod displaceable between a cut-on position and a cut-off position;
means for driving said drive rod;
a respective lever drive means operatively connected with a related one of said switch positions and operatively coupling each said switch position with said drive rod;
said lever drive means of said primary switch position containing a double-arm lever;
a stationarily arranged and rotatably mounted shaft about which there is pivotably mounted said double-arm lever;
said double-arm lever having a first end and a second end;
said primary switch position having a movable switching element;
said first end of said double-arm lever being coupled with said drive rod and said second end with said movable switch element of said primary switch position;
said lever drive means of said auxiliary switch position being structured such that during a cut-on stroke there is initially closed said auxiliary switch position and such again opened at the end of said cut-on stroke;
said lever drive means of said auxiliary switch position comprising a pivotable arm member driven by said double-arm lever;
said pivotable arm member having a free end;
cam means;
pivot shaft means for mounting said cam means at said free end of said pivotable arm member so as to be movable between two stable positions about said pivot shaft means which extends essentially parallel to said rotatably mounted shaft;
said cam means having a cam track; and
said auxiliary switch position containing a movable switching element carrying a cam follower engageable with said cam track.

4,433,221

IMPEDANCE CONTACT ASSEMBLY FOR AN ELECTRIC CIRCUIT BREAKER

Harold N. Schneider, Springfield; James H. Simpson, Media, and Raymond F. Weidman, Springfield, all of Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Aug. 25, 1982, Ser. No. 411,223
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **5 Claims**



1. In an electric circuit breaker,
(a) a pair of separable interrupting contacts, one of which comprises a contact rod having a longitudinal axis along which said contact rod is movable during circuit-making and circuit-breaking operations,
(b) an impedance contact assembly for making electrical contact with said contact rod along two sides of said contact rod when the contact rod is located near the other interrupting contact,
(c) an impedance connected between said impedance contact assembly and said other separable interrupting contact,
(d) said impedance contact assembly comprising:
(i) a ring of conductive metal to which said impedance is electrically connected,
(ii) two slots in said ring at diametrically-opposed locations,
(iii) a U-shaped spring member of conductive metal having two spaced-apart arms and a bight portion interconnecting said arms at one end of the arms, the other end of the arms constituting free ends, the spring member being positioned with its bight portion in one of said slots and the free ends of said arms in the other of said slots and having a resilience tending to bias said free ends apart and against the walls of said other slot,
(e) the path of movement of said contact rod extending between said spaced-apart arms so that said arms slidably engage said contact rod at opposite sides thereof as said contact rod is moved along said path while near said other interrupting contact,
(f) said contact rod at the end of a circuit-breaking operation leaving the space between said spaced-apart arms and forming an arc between said contact rod and one of said arms, and

(g) said contact rod having a diameter sufficiently large as to force said free ends of said arms into higher pressure engagement with the walls of said other slot when the contact rod reenters the space between said arms during a circuit-making operation.

4,433,222

MINIATURIZED PUSH BUTTON SWITCH

Yasuo Kodaira, Tokyo, Japan, assignor to Nihon Kaihatki Industrial Company, Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,113
Claims priority, application Japan, Jan. 31, 1981, 56-11646
Int. Cl.³ H01H *3/46*
U.S. Cl. 200—153 J **10 Claims**

1. A push button switch comprising a switch body defining an enclosure;

support surface means disposed within said enclosure;

a pivotable converter disposed above and supported by said support surface means, one of said converter and said support surface means having a projection formed thereon and the other one of said converter and said support surface means having a depression formed therein for cooperating with said projection such that said converter pivotably engages said support surface means and is pivotable between first and second positions with respect to an imaginary fulcrum plane, said projection and said depression defining a pivot joint and a pivot axis;

an operator actuable push rod extending through said switch body into said enclosure with a base which is spaced from said converter, said push rod being axially displaceable with respect to a displacement axis and having a depending, elongated converter actuator spaced from and substantially parallel to said displacement axis for pushing against said converter at a single predetermined location thereon so as to pivot said converter in the direction of said second position when said push rod is displaced from an unactuated limit position;

compression spring means disposed between said push rod and said converter for biasing said push rod toward said limit position and said converter toward said support surface means;

three spaced stationary contact members aligned in a row, said row extending transversely with respect to said fulcrum plane and being axially spaced from said pivot joint with respect to said pivot axis; and

an elongated movable contact member fixedly mounted on said converter relatively above said pivot axis and in relative alignment with said stationary contact members such that said movable contact member bridges the central one of said stationary contact members and is arcuately displaced into and out of sliding contact with the respective end ones of said stationary contact members as said converter is pivoted between said first and second positions.

4,433,223

PRESSURE-SENSITIVE ADHESIVE AND APPLICATION THEREOF

Willis A. Larson, and Anthony J. Van Zeeland, both of Crystal Lake, Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Aug. 24, 1981, Ser. No. 295,717
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—159 B **5 Claims**

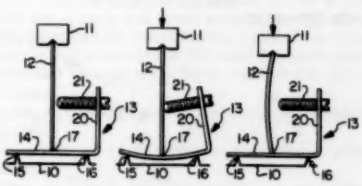
1. A membrane switch having a membrane and a substrate spaced therefrom, spaced electrical contacts on said membrane and substrate, and a pressure sensitive conductive adhesive securing said membrane and substrate together and providing an electrical connection therebetween.

4,433,224

ACTUATOR MECHANISM WITH ENHANCED TACTILE CHARACTERISTICS

Robert D. Kitchen, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1982, Ser. No. 435,010
Int. Cl.³ H01H *5/18*
U.S. Cl. 200—330 **16 Claims**



1. An actuator mechanism with enhanced tactile characteristics, comprising:

a frame;

a resilient column mounted in said frame aligned with and adapted to accept a force along a first axis; and

force transfer means mounted on said frame and having a first portion for receiving a force along the first axis from said resilient column and a second portion for responsively applying a force transverse to the first axis to said resilient column at an intermediate location thereon, said resilient column being adapted to buckle in a direction transverse to the first axis and positioned to be deflected by the second portion of said force transfer means when a predetermined force is applied to the first portion thereof, whereby buckling of said resilient column is repeatably controlled.

4,433,225

KEYTOP LEVELLING MECHANISM

Dean S. Cowles, Spokane, Wash., assignor to General Instrument Corporation, New York, N.Y.

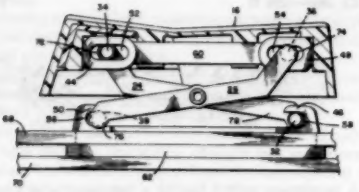
Filed Feb. 22, 1983, Ser. No. 468,127
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—340 **9 Claims**

7. A keytop levelling mechanism for use in conjunction with a substantially hollow L-shaped keytop, said mechanism comprising:

a scissors-like linkage having first, second, third, and fourth ends adapted to fit between the ascender portion of said L-shaped keytop and a base situated under said keytop;

first means for mounting said first and second ends within the hollow portion of said ascender portion at longitudinally opposed ends thereof; and

second means for mounting said third and fourth ends to said base;



said first and second mounting means adapted to provide articulating joints enabling said linkage to collapse in scissors-like fashion when said keytop is moved toward said base,

whereby said scissors-like linkage maintains said keytop level throughout its movement toward and away from said base.

4,433,226

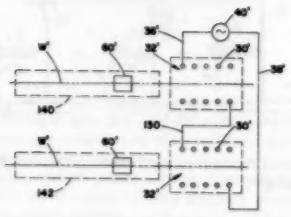
METHOD AND APPARATUS FOR INDUCTION HEATING OF AN ELONGATED WORKPIECE

Richard L. Wagar, Wadsworth, Ohio, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Nov. 12, 1981, Ser. No. 320,550

Int. Cl.³ H05B 6/06

U.S. Cl. 219—10.41 **2 Claims**



1. A method for inductively heating an elongated workpiece to a generally uniform temperature over the length thereof wherein said workpiece has a first portion with a uniform cross-section extending over a major part of the workpiece length and a second portion with a cross-section greater than said one portion, said method comprising the steps of:

(a) providing a plurality of substantially identical multi-turn inductors, each having an entrance end and an exit end, with said inductors being laterally spaced apart from each other coaxially about a plurality of parallel spaced apart workpaths;

(b) feeding simultaneously substantially identical workpieces longitudinally along said plurality of workpaths at some predetermined rate of travel toward and through said inductors from said entrance end, each of said workpieces having a first portion with a uniform cross-section extending over a major portion of the workpiece length and a second portion with a cross-section greater than said first portion;

(c) sensing one of said workpiece first and second portions adjacent the entrance end of each inductor;

(d) causing each inductor to be energized to a preselected first level at least during said step of feeding for inductively heating said one of said workpieces first and second portions to generally a preselected temperature as it passes through the inductor;

(e) changing the energization level of each inductor to a predetermined second level different from said first level at some first preselected time interval following said step of sensing for inductively heating the other of said workpiece first and and second portions to generally said preselected temperature as it passes through the inductor; and,

(f) thereafter returning each inductor to said first level of energization.

4,433,227

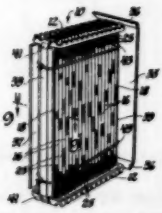
METHOD OF INDUCTIVELY HEATING WORKPIECES TO A UNIFORM TEMPERATURE

Craig E. Brittin, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 20, 1982, Ser. No. 419,942

Int. Cl.³ H05B 6/06

U.S. Cl. 219—10.41 **8 Claims**



1. A method of inductively heating a plurality of metal members to a substantially uniform temperature comprising the steps of:

placing at least two adjacent members in a heating cavity so that during inductive heating outer member surfaces not facing another heated member will tend to lose heat by radiation,

locating metal radiator panels in the heating cavity adjacent the said outer member surfaces, and

establishing an alternating magnetic field in the heating cavity for inductively heating the members and for inductively heating the radiator panels to a temperature near that of the members whereby the heated panels radiate toward the outer member surfaces to reduce the net radiation from the outer member surfaces to provide uniform heating of the elements.

4,433,228

MICROWAVE PLASMA SOURCE

Shigeru Nishimatsu, Kokubunji; Keizo Suzuki, Hachioji; Noriyuki Sakudo, Ome; Ken Ninomiya, Tokyo; Hidemi Koike, Tokorozawa; Osami Okada, Chofu; Shinjiro Katagiri, Katsuta, and Sadayuki Okudaira, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 319,987

Claims priority, application Japan, Nov. 12, 1980, 55-158300

Int. Cl.³ H05G 9/06

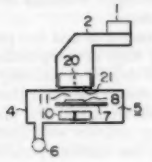
U.S. Cl. 219—10.55 R **20 Claims**

1. A microwave plasma source comprising:

a vacuum room which includes a discharging space in which discharge gas is introduced;

means for introducing microwave energy through a propa-

gating path leading to said discharging space to provide a microwave electric field in said discharging space; and



a permanent magnet located in said propagating path leading to said discharging space for generating a magnetic field in said discharging space.

4,433,229

ELECTRODE ROLL FOR RESISTANCE WELDING

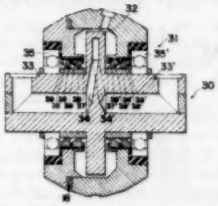
Yonekichi Morikawa, Shizuoka; Toshio Shimizu; Eiichi Yoshida, both of Shimizu; Tsuyoshi Konagaya, Yaizu, and Keizo Hirayama, Tokyo, all of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,927

Claims priority, application Japan, Nov. 29, 1980, 55-168321

Int. Cl.³ B23K *11/06;* **H01R** *39/30*

U.S. Cl. 219—84 **3 Claims**



1. In an electrode roll for resistance welding which includes a fixed portion of stepped tubular form including a shaft and a disc portion at the longitudinal center of said shaft, said disc portion having opposite side surfaces, a peripheral surface and a diameter which is larger than the diameter of said shaft; a rotary portion surrounding said fixed portion, supported in a freely rotatable manner by the end portions of said shaft and having inner surfaces which respectively face said opposite side surfaces of said disc portion to define respective side gaps therebetween, and face said peripheral surface of said disc portion to define a peripheral gap therebetween; and isolation parts adjacent said fixed portion which isolate said side gaps and said peripheral gap air-tightly from the outside and define isolated spaces therein for holding lubricating oil, a conductive liquid metal being held in said side gaps and said peripheral gap, the improvement wherein:

said peripheral gap has a width which enables it to pull up said conductive liquid metal along said peripheral gap when said rotary portion rotates, so as to fill up said peripheral gap with said conductive liquid metal;

said side gaps each having a larger width than said width of said peripheral gap; and

the widths of said side gaps and peripheral gap being such, and the amount of said conductive liquid metal held in said side gaps and said peripheral gap being sufficient, that said peripheral gap is filled up with said conductive liquid metal during rotation of said rotary portion, and the level of said conductive liquid metal in said side gaps is below said isolation parts so as not to enter said isolated spaces, when said electrode roll is allowed to stand nonrotatively with said shaft of said fixed portion extending horizontally.

4,433,230

METHOD OF MANUFACTURING A VACUUM VESSEL PROVIDED WITH A RADIATION-PERMEABLE WINDOW

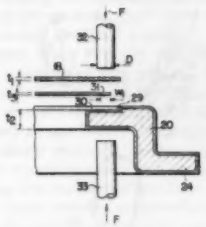
Tetsu Sano, Tokyo; Takezou Yasuzuka; Hisao Ishiwata, both of Yokohama, and Tatsuo Simizu, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 3, 1981, Ser. No. 270,214

Claims priority, application Japan, Jun. 5, 1980, 55-74945

Int. Cl.³ B23K *11/20*

U.S. Cl. 219—118 **4 Claims**



1. A method of manufacturing a vacuum vessel, which comprises the steps of:

superposing a radiation-permeable window member of titanium or alloys thereof, a support frame of iron or alloys thereof and a metal foil insert member having a lower melting point than the transformation point of the window member in such a manner that the metal foil insert member is interposed between the window member and the support frame;

holding the superposed members between a pair of welding electrodes;

applying a pressure of 40 to 200 kg/cm^2 to the welding electrodes;

conducting an electric current through said electrodes to heat-melt the insert member at a temperature lower than the transformation point of the window member thereby welding the window member and the support frames together; and

successively carrying out said welding in such a manner that the adjacent welded portions are in contact with each other contiguously all along the periphery of the window member.

4,433,231

ELECTRIC IRON HAVING STACKED THERMOSTAT ASSEMBLY WITH INTEGRAL OVERTEMPERATURE PROTECTION CONTROL

Charles A. Balchunas, Bethany, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,320

Int. Cl.³ H05B *1/02;* **H01H** *37/76;* **D06F** *75/26*

U.S. Cl. 219—253 **8 Claims**

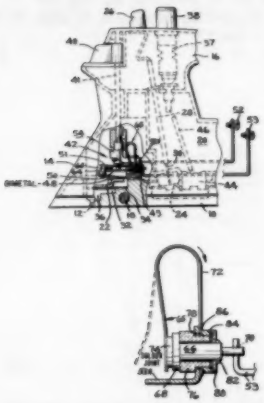
1. In a stacked thermostat adjustable assembly including a connecting member, a lower heat deformable blade, a conductive intermediate stiff spring blade electrically connected to said member, a first electric terminal, a conductive upper less stiff spring blade electrically connected to a second terminal, with all blades supported, secured, and spaced apart at one end by interposed insulators, and cooperable electrical contacts on said conductive blades for making an electrical circuit therebetween with means transmitting movement between the heat deformable blade to said upper blade to make and break said

electric circuit and control heat to a medium sensed by said thermostat, the improvement of an overtemperature control means as part of said stacked assembly comprising,

a conducting rivet at said assembly secured and electrically connected to said first electric terminal,

a conducting compressed spring member soldered at one end to said rivet said solder joint being fusible to melt and break the circuit between said spring member and rivet at a selected temperature,

insulating means between the other spring end and said first terminal,



said other end of said spring being electrically connected to said connecting member to complete said electrical circuit from said first terminal through said rivet, spring, connecting member, blades and contacts to said second terminal,

said spring extending generally perpendicular to the rivet axis and parallel to and adjacent the stacked assembly, whereby said spring responds to the same heat as said deformable blade in series with said assembly for fast heat response.

4,433,232

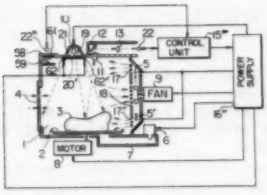
HEATING APPARATUS

Hajime Tachikawa, Fujisawa, and Shuji Ohkawa, Yokohama, both of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed May 29, 1981, Ser. No. 268,351

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—502 **5 Claims**



1. A heating apparatus comprising:

a heating chamber;

heating means capable of heating an object to be heated placed in said heating chamber so that the color of a surface of said object changes to a given extent as the heating progresses;

light source means emitting light of visible spectrum range illuminating the surface of said object placed in said heating chamber;

first photo sensor means for sensing the wavelength of light of visible spectrum range, reflected from the surface of said object being heated;

means for storing an output of said first photo sensor means at an initial heating stage in every heating cycle;

means for judging the degree of charring of the surface of said object in response to the value stored in said storing means and an output from said first photo sensor means which changes in accordance with heating progress;

means for controlling the heating operation of said heating means in response to an output from said judging means; and

second photo sensor means for sensing the intensity of light reflected from the surface of said object being heated, said judging means judging the degree of charring of the surface of said object in response to the output from said first sensor means as well as an output from said second photo sensor means.

4,433,233

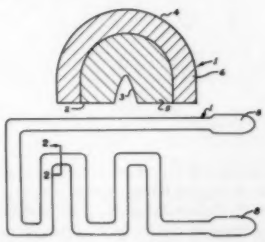
SILICON CARBIDE HEATING ELEMENTS

Frank J. Hierholzer, Jr., Florissant; John A. Ancona, Affton, and Gerald L. Shelton, St. Louis, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 79,424, Sep. 27, 1979, Pat. No. 4,328,529, which is a division of Ser. No. 832,555, Sep. 12, 1977, Pat. No. 4,302,508, which is a continuation of Ser. No. 513,729, Oct. 10, 1974, abandoned. This application Oct. 23, 1981, Ser. No. 314,102

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—553 **13 Claims**



1. In an electrical resistance heating element comprising a heating member formed of silicon carbide and at least one electrical contact held to said heating member, the improvement wherein a part of said contact is embedded in said silicon carbide and is bonded to said silicon carbide by said silicon carbide, and wherein said contact is a metal strip and including at least one opening in said contact, said silicon carbide extending into said opening and forming an interference fit with said contact.

4,433,234

MECHANICAL PRESELECTION COUNTER

Fritz Kübler, VS-Schwenningen, Fed. Rep. of Germany, assignor to Ing. Fritz Kübler, Zählerfabrik GmbH, Schwenningen, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,507

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112678

Int. Cl.³ G06F *15/18*

U.S. Cl. 235—132 E **21 Claims**

1. A mechanical preselection counter, comprising:

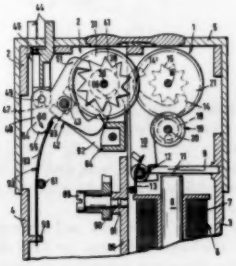
a counter provided with figure rollers and a zero-setting device for said figure rollers including means for operative relationship therebetween;

a preselection unit provided with preselection rollers and transmission gears, with the number of said preselection rollers and said transmission gears respectively corresponding to the number of said figure rollers; said transmission gears being operatively connected with said figure rollers and being respectively provided with at least two openings;

an adjustment element associated with each preselection roller for adjusting the latter, said adjustment elements being held in the rest position by spring force;

a coupling device for connecting said adjustment elements with said zero-setting device;

actuating elements for operating said adjustment elements;



keying devices respectively associated with said transmission gears and said preselection rollers, each keying device having at least two axially projecting noses adapted to project through said openings of an associated transmission gear, with said preselection rollers being provided with recesses respectively coordinated with said openings of said transmission gears; and

a releasing rack for loading said keying devices toward said preselection rollers; with the noses of a given keying device being spaced from one another, as well as with the recesses of a given preselection roller being spaced from one another, in such a way that said noses, during a complete rotation of the associated transmission gear, drop into the recesses of an associated preselection roller in only one position.

4,433,235

FOCUSING POSITION DETECTING DEVICE IN OPTICAL MAGNIFYING AND OBSERVING APPARATUS

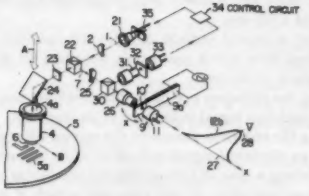
Nobuyuki Akiyama; Yoshimasa Ohshima, and Mitsuyoshi Koizumi, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,240

Claims priority, application Japan, Oct. 9, 1980, 55-140610; May 25, 1981, 56-78096

Int. Cl.³ G01J *1/20, 1/32*

U.S. Cl. 250—201 **9 Claims**



1. A focusing position detecting device in which a laser beam is directed through an objective lens toward and onto the surface of an object to form a minute spot on the surface of said object, and the beam reflected from the surface of said object is sensed to detect the focusing position of said objective lens, said device comprising:

(a) laser beam emitting means for emitting the laser beam;

(b) an incidence optical system guiding the laser beam emitted from said laser beam emitting means toward said objective lens;

(c) a focusing position detecting optical system guiding from said objective lens the beam reflected from the surface of said object so as to lead said reflected beam toward a concentrating point, said optical system including at least an oscillating plate provided with a pin-hole or a slit in the vicinity of the concentrating point of said reflected beam and arranged for oscillation in the direction of the optical path of said reflected beam and a first photoelectric element converting the intensity of the reflected beam passing through the pin-hole or slit of said oscillation plate into a corresponding electrical quantity;

(d) a reflected beam intensity measuring optical system receiving a portion of said reflected beam for measuring the intensity of said reflected beam, said optical system including at least a second photoelectric element detecting the intensity of said reflected beam; and

(e) control means receiving the intensity-indicative output from said second photoelectric element as an input for controlling the intensity of the laser beam emitted from said laser beam emitting means whereby to maintain the constant the intensity-indicative output from said second photoelectric element.

4,433,236

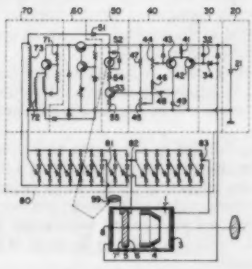
AUTOMATIC BRIGHTNESS CONTROL AND WARNING CIRCUIT FOR IMAGE INTENSIFIER TUBE

Mitsuhiro Shimada, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 15, 1981, Ser. No. 330,810

Int. Cl.³ H01J *3/14*

U.S. Cl. 250—213 VT **6 Claims**



1. An automatic brightness control and warning circuit for an image intensifier tube which includes a photocathode, a microchannel plate having input and output electrodes and a phosphor screen, comprising:

(a) a screen current rectifying circuit which rectifies a current of the phosphor screen and obtains a signal corresponding to the brightness of the phosphor screen;

(b) a differential amplifier which compares the signal obtained in the screen current rectifying circuit with a reference signal and generates a signal which increases proportionally to the phosphor screen current;

(c) a gas discharge tube;

(d) a transistor connected in series with the gas discharge tube with respect to a power source of the gas discharge tube and connected at its control input terminal with the

signal of the differential amplifier; thereby an internal resistance of the transistor being controlled;

(e) a direct current power source applying a bias voltage to the microchannel plate;

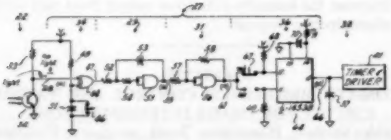
(f) a photoconductor connected with the direct current power source in series with respect to the microchannel plate and photoelectrically coupled to the gas discharge tube; and

(g) a delaying element provided in a path for the signal from an output terminal of the phosphor screen current rectifying circuit and a control input terminal of the transistor; whereby enabling automatic brightness control so as to slightly increase the phosphor screen current in the automatic brightness control region of the brightness of the phosphor screen, and when an incident light into the photocathode is excessive, blinking the phosphor screen by a relaxation oscillation determined by the delaying element and the characteristic of the gas discharge tube.

4,433,237

COATING SYSTEM CONTROL HAVING A SENSOR INTERFACE WITH NOISE DISCRIMINATION

Timothy S. Matt, Bay Village, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 14, 1981, Ser. No. 301,522
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—222.1 **10 Claims**

1. In a system for automatically coating objects with a coating material having means for discharging the coating material in response to a control signal, means for moving the objects relative to the discharge means in a path past the discharge means and a timing and driver circuit for generating, in response to a sensor signal at an input, a delayed control signal which is coupled to the discharge means, an improved sensor circuit arrangement comprising:

object detecting means, including a sensor positioned along the path, for producing an object detection signal at an output when an object reaches a particular position along the path;

an integrator coupled to the output of the object detecting means operable to produce at an output a signal representative of the integral of the detecting means output; and

a trigger circuit coupled to the integrator output and operable to produce a wave having substantially sharp edges at an output which is coupled to the input of the timing and driver circuit.

4,433,238

OPTICAL MEASUREMENT SYSTEM FOR SPECTRAL ANALYSIS

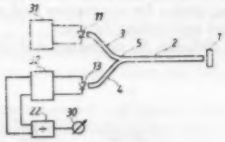
Morgan Adolfsson; Torgny Brogardh; Sture Göransson, and Christer Ovren, all of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Oct. 19, 1981, Ser. No. 312,750
Claims priority, application Sweden, Oct. 21, 1980, 8007376
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **20 Claims**

1. An optical measuring device for measuring at least one parameter of an object at a given location, which device comprises:

a source of incident light which incident light, during a parameter-measuring operation, has a given spectral distribution,

a sensor adapted to be positioned at said given location and to emit output light when irradiated by said incident light, the spectral response of said output light to said incident light during a parameter-measuring operation being changed by a change in the parameter to be measured,



a light detector adapted to generate an output measuring signal when irradiated, during a parameter-measuring operation, with said output light from said sensor,

optical means for transmitting incident light to said sensor and transmitting output light from said sensor to said light detector, and

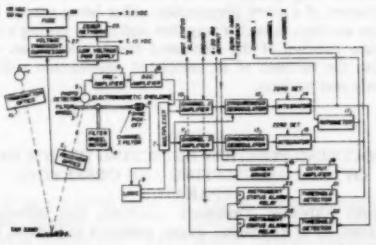
electronic means for sensing and controlling the temperatures of the light source and the light detector in intervals when the parameter-measuring operation is discontinued.

4,433,239

METHOD AND APPARATUS FOR ON-LINE MONITORING OF BITUMEN CONTENT IN TAR SAND

Gordon R. Thompson, Edmonton, Canada, assignor to Petro-Canada Exploration Inc., Calgary

Filed Feb. 12, 1981, Ser. No. 233,992
Int. Cl.³ G01V *9/04*; G01J *3/38*
U.S. Cl. 250—255 **2 Claims**



1. A method for monitoring the bitumen content trends of an advancing layer of tar sand, comprising:

shining an uninterrupted beam of near infrared radiation onto the surface of said advancing tar sand to produce reflected radiation;

filtering a first portion of the reflected radiation through a first filter which passes only wavelengths of about 2180 to about 2260 nm;

filtering a second portion of reflected radiation through a second filter which passes only wavelengths of about 2270 to about 2350 nm;

sensing the radiation passed by the first filter and producing an electrical signal indicative of its intensity;

sensing the radiation passed by the second filter and producing an electrical signal indicative of its intensity;

establishing a ratio of said signals and producing an electrical output indicative of said ratio and which is indicative of the bitumen content of the tar sand; and

continuing the foregoing steps sufficiently frequently to give

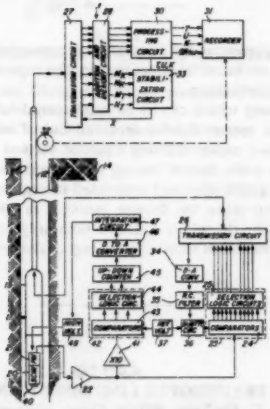
a reading representative of the bitumen content of the tar sand.

4,433,240

METHOD AND APPARATUS FOR MEASURING GAMMA RAYS IN A BOREHOLE

Bronislaw Seeman, Meudon, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,670
Claims priority, application France, Jun. 25, 1980, 80 14066
Int. Cl.³ G01V 5/00
U.S. Cl. 250—256 29 Claims



1. An apparatus for measuring gamma rays coming from formations traversed by a borehole, comprising:

detection means for converting the gamma rays into electric pulses whose amplitudes are related to the energies of the gamma rays;

discrimination means for sorting these electric pulses according to their amplitudes in order to furnish information on the energy spectrum of the received gamma rays, said discrimination means comprising means for separating the electric pulses at least into two first contiguous windows located on each side of a first predetermined value and into two second contiguous windows located on each side of a second predetermined value, said predetermined values corresponding to two reference peaks wherein at least one of said reference peaks is a peak provided by thorium, uranium, or potassium gamma ray spectra coming from the formations;

means responsive to the pulses of said first and second windows in order to generate an error signal; and

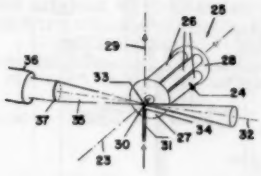
means responsive to said error signal for modifying the response of the measurement apparatus in order to stabilize said response.

4,433,241

PROCESS AND APPARATUS FOR DETERMINING MOLECULE SPECTRA

Ulrich Boesl, Sommerstr. 7, 8000 München 90; Hans J. Neusser, Eggmühlerstr. 6, 8000 München, and Edward W. Schlag, Osterwaldstr. 91, 8000 München 40, all of Fed. Rep. of Germany

Continuation of Ser. No. 97,643, Nov. 27, 1979, abandoned. This application Feb. 16, 1982, Ser. No. 349,322
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942386
Int. Cl.³ B01D 59/44
U.S. Cl. 250—282 11 Claims



7. A method for determining molecular spectra of isotopic mixtures comprising the steps of:

(a) introducing unseparated isotopic mixtures of molecules having a structured spectrum through a nozzle means to form an effluent molecular beam;

(b) directing said molecular beam from said nozzle means into a photoreaction vessel along a first axis;

(c) directing a laser beam along a second axis substantially perpendicular to said first axis within said photoreaction vessel;

(d) focusing said laser beam to a point within said molecular beam;

(e) adjusting the wavelength of said laser beam within a spectral range included within said structured spectrum;

(f) adjusting the intensity of said laser beam to perform stimulation of selected molecules in said molecular beam to energy levels just above the ionization threshold thereof by at least two absorption steps to ionize said selected molecules;

(g) accelerating the selected molecules so ionized along a third axis in said reaction vessel perpendicular to a plane formed by said first and second axes;

(h) providing a mass spectrometer on said third axis for determining the concentration of selected masses of said ionized selected molecules; and

(i) correlating said mass concentrations of the selected wavelengths of said laser beam to produce a two-dimensional molecular spectra having parameters of wavelength and mass, whereby the geometrical relationship between said laser beam, molecular beam and said beam of ionized molecules causes the immediate separation of ionized molecules from unionized molecules within the photoreaction vessel and enhances the ionization efficiency of said photoreaction vessel.

4,433,242

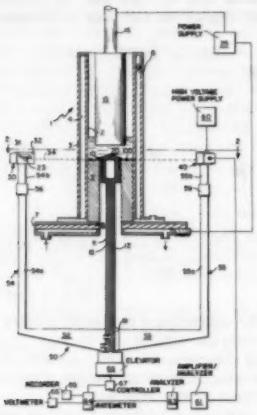
ESR HOLLOWS MOLTEN METAL/SLAG INTERFACE DETECTION

Bernard Harris, Chelmsford, Mass., and Howard J. Klein, Kokomo, Ind., assignors to Cabot Corporation, Boston, Mass.

Filed Aug. 20, 1981, Ser. No. 294,536
Int. Cl.³ G01N 23/00; G01T 1/20
U.S. Cl. 250—358.1 16 Claims

1. In an ESR hollows furnace comprising a crucible; a mandrel located substantially coaxially within said crucible, said mandrel being upwardly driven to define a progressive annular casting zone between said mandrel and said crucible; and means to deliver a consumable metallic electrode into said

crucible and to maintain a substantially constant spacing between the upper end of said mandrel and the lower end of said electrode, the improvement which comprises: a molten metal slag interface detection system comprising a gamma radiation source and a scintillation counter, said source and said counter each being stationed exterior said crucible, means to maintain said source and said counter in fixed spatial relationships with



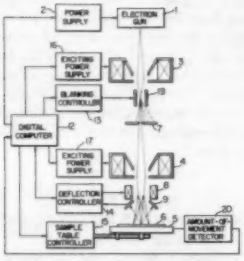
respect to said mandrel and to one another, said source being oriented to direct a gamma radiation beam therefrom along a radiation path which traverses said annular casting zone without direct contact of said beam with said mandrel, said counter being oriented to sense said source radiation beam upon traversal thereof through said annular casting zone and said crucible and said counter being operative to produce a detectable electrical signal responsive to said sensed beam.

4,433,243

ELECTRON BEAM EXPOSURE APPARATUS

Kazumitsu Nakamura, Katsuta, and Masaru Miyazaki, Ome, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,451
Claims priority, application Japan, Aug. 1, 1980, 55-105017
Int. Cl.³ G01K *1/08*; B23K *15/00*
U.S. Cl. 250—397 **10 Claims**



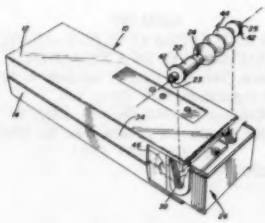
1. An electron beam exposure apparatus comprising:
means for generating an electron beam;
means for scanning a reference mark formed on a sample by said electron beam so as to determine the position of the reference mark, and for scanning said sample so that a predetermined pattern with respect to the position of said reference mark is formed on said sample; and
means for changing the energy of said electron beam to a higher value upon scanning of said reference mark than upon scanning said sample.

4,433,244

APPARATUS FOR IRRADIATING TUBING CONNECTIONS

Lawrence R. Hogan, Lake Villa, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 19, 1982, Ser. No. 359,740
Int. Cl.³ A61L *2/10*; G21K *5/08*; H01J *37/20*
U.S. Cl. 250—455.1 **17 Claims**



1. In apparatus for irradiating a connected pair of tubing ends for antibacterial effect therein, the improvement comprising, in combination:
a housing which carries an antibacterial radiation source;
drawer means slidable into and out of said housing, said drawer means defining a pair of vertical slots in opposed side walls thereof having open upper ends for receiving and positioning said connected tubing ends in the drawer means when the drawer means is in open position, and moving the tubing ends into proximity with the antibacterial radiation source by closing of the drawer means.

4,433,245

FRAUNHOFER LINE DISCRIMINATOR

Sherman K. Poultney, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 25, 1982, Ser. No. 342,613
Int. Cl.³ F21V *9/16*
U.S. Cl. 250—458.1 **13 Claims**

1. An apparatus for detecting fluorescence of materials in a sunlit scene, comprising,
optical means directed to receive reflected sunlight from the scene,
said optical means comprising,
first means providing a fringe pattern of a preselected Fraunhofer line,
second means focusing said fringe pattern at a predetermined focal plane,
a first plurality of light detectors disposed to receive light from a selected ring in said fringe pattern,
a second plurality of light detectors disposed to receive light away from said selected ring,
each one of said second plurality of light detectors being adjacent an associated one of said first detector,
processor means connected to said light detectors for calculating the fluorescence in the light detected from each individual spot in a scene viewed by each of said first plurality of light detectors.

4,433,246

BLACKBODY RADIATION SOURCE FOR PRODUCING CONSTANT PLANAR ENERGY FLUX

Richard S. Muka, Topsfield, and Carl J. Russo, Ipswitch, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 262,838, May 12, 1981. This application May 28, 1982, Ser. No. 382,852
Int. Cl.³ H05B 1/00
U.S. Cl. 250—492.1 3 Claims

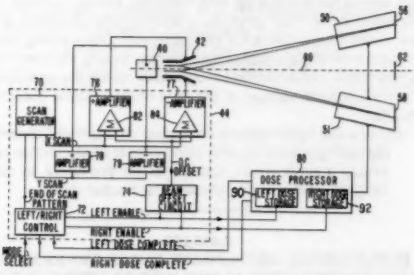
1. A blackbody radiation source for producing a constant planar energy flux including infrared radiation in combination with a support member for positioning a semiconductor wafer in close coupled opposition to said source, said support member comprising refractory metal internal thermal shield means positioned on the opposite side of said source from said wafer, for reflecting said infrared radiation and reducing thermal losses, and said internal shield means comprising a concave shield member for receiving said semiconductor wafer for thermal treatment, thereby providing uniform heating through the thickness of said wafer.

4,433,247

BEAM SHARING METHOD AND APPARATUS FOR ION IMPLANTATION

Norman L. Turner, Gloucester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 28, 1981, Ser. No. 306,056
Int. Cl.³ G01N 23/00
U.S. Cl. 250—492.2 5 Claims



1. Apparatus for ion implantation of at least two workpieces mounted in fixed positions in said apparatus during ion implantation, said apparatus comprising:

means for production of an ion beam having a straight segment with a longitudinal axis;

ion beam scanning means comprising

means for successively and repetitively directing said beam from said longitudinal axis to each workpiece for a predetermined time interval which is small in comparison with the thermal time constant of each workpiece when mounted in said apparatus,

means for deflecting said beam during each of said time intervals in a two-dimensional scan pattern over the surface area of the one of said workpieces to which said beam is directed, and

means for synchronizing said scan pattern to said time interval such that an integral number of scan patterns is completed during each time interval; and

means for individually measuring ion beam dosage of each workpiece and for discontinuation of ion beam scanning when a predetermined ion beam dosage is measured,

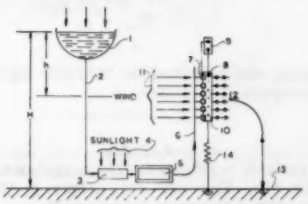
whereby the temperature rise of each workpiece is less than that produced when said workpiece is implanted on a continuous basis and the ion beam dosage applied to each workpiece is uniform over the surface area of the workpiece and is accurately controlled.

4,433,248

CHARGED AEROSOL WIND/ELECTRIC POWER GENERATOR WITH SOLAR AND/OR GRAVITATIONAL REGENERATION

Alvin M. Marks, 166-35 Ninth Ave., Whitestone, N.Y. 11357

Filed Apr. 7, 1982, Ser. No. 366,139
Int. Cl.³ H02N 1/00
U.S. Cl. 290—44 17 Claims



1. A charged aerosol generator and a load combination, comprising a charged liquid droplet emitter means, a gas stream, a grounded collector electrode at a distance from said emitter means, a load, said load being connected between said emitter means and said collector electrode, the said emitter means producing charged droplets which have a ratio of radius to number of electron charges of at least 100 Å per electron charge, said gas stream flowing around said emitter means and receiving said charged droplets whereby the heat/kinetic power of said gas stream is transduced to electric power at said load, and a solar source to supply power to said emitter means.

4,433,249

ENERGY CONSERVATION SYSTEM

Walter E. Long, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

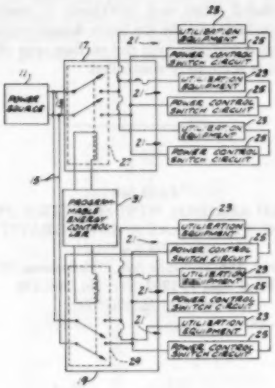
Filed Sep. 11, 1981, Ser. No. 301,180
Int. Cl.³ H02J 1/00
U.S. Cl. 307—31 13 Claims

1. An energy conservation system for use with a power source which supplies power over premises wiring to utilization equipment such as lighting equipment and the like, said system comprising:

means independent of the magnitude of the electrical load drawn by the utilization equipment for temporarily interrupting at predetermined times the supplying of power from the power source to at least a portion of the utilization equipment; and

at least one switching circuit connected in series between the power source and said portion of the utilization equipment, said switching circuit being responsive to the temporary interruption of power to open the circuit between the power source and said portion of the utilization equip-

ment and to maintain said circuit open after the temporary interruption of power ceases, thereby automatically deenergizing said portion of the utilization equipment upon interruption of the power.



4,433,250

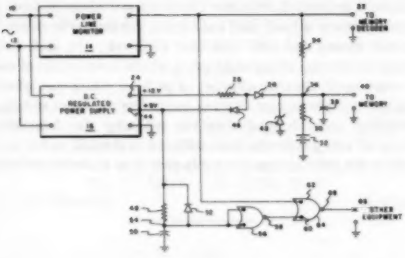
POWER SUPPLY CONTROL APPARATUS

Jawed M. Khan, Clearwater, Fla., assignor to GTE Business Communication Systems Inc., McLean, Va.

Filed Jul. 29, 1982, Ser. No. 402,867

Int. Cl.³ H02J *9/00*

U.S. Cl. 307—66 **5 Claims**



1. Apparatus adapted for connection to an alternating current source and a direct current power supply powered by said source, said supply being operative when the source is enabled and being disabled when the source is inoperative, said apparatus comprising:

first, second and third terminals;

a power line monitor connected at its input to said source and at its output to said first terminal, said monitor being operative to maintain said first terminal at a selected potential when the source is operative, said monitor being rendered inoperative and being unable to maintain said first terminal at any potential when said source is inoperative;

a battery;

a first resistor connected in circuit with said battery;

first means connected to said supply, said first resistor and said second terminal to charge said battery and to maintain said second terminal at a selected potential when the supply is disabled;

a second resistor connected between said first resistor and said first terminal to maintain said first terminal at a different potential when said monitor is inoperative; and

second means connected to said first terminal, said supply, and said third terminal to maintain said third terminal at a selected potential when said monitor is operative and to maintain said third terminal at a different potential when said monitor is inoperative, said second means including a NOR gate having an output connected to said third terminal, a first input coupled to said supply and a second input connected to said first terminal.

4,433,251

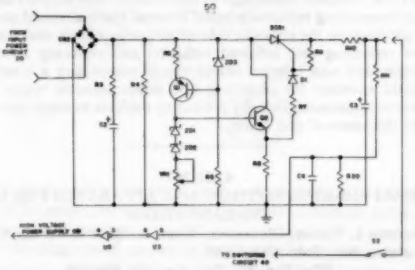
POWER SUPPLY CIRCUITRY

William D. Banks; Frank G. Bond, both of Shrewsbury, and Raymond L. Naylor, Framingham, all of Mass., assignors to Dennison Manufacturng Company, Framingham, Mass.

Filed Sep. 21, 1981, Ser. No. 304,298

Int. Cl.³ H03K *17/56, 17/60, 3/26*

U.S. Cl. 307—246 **3 Claims**



1. Improved drive circuitry of the type including an electrical storage element, means for routing electrical energy from said electrical storage element to a load during "on" periods, and means for recharging said electrical storage element during intervening "off" periods, a time-varying potential, a silicon controlled rectifier for receiving said time-varying potential and delivering a recharging current to said electrical storage element, and a threshold regulating means for establishing a predetermined voltage at the gate of said silicon controlled rectifier,

wherein the improvement comprises an improved threshold regulating means for said silicon controlled rectifier comprising a zener diode, and means for providing an essentially constant current through said zener diode.

4,433,252

INPUT SIGNAL RESPONSIVE PULSE GENERATING AND BIASING CIRCUIT FOR INTEGRATED CIRCUITS

Scott C. Lewis, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,438

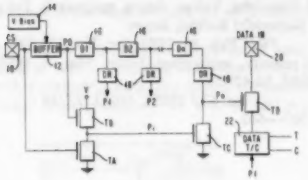
Int. Cl.³ H03K *5/135, 17/284;* **H03L** *1/00*

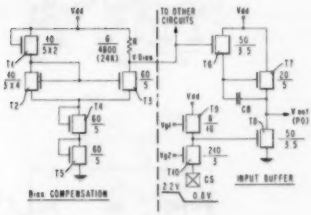
U.S. Cl. 307—269 **14 Claims**

1. A signal generating circuit for an integrated circuit device responsive to first and second externally applied input signals occurring at an externally determined time interval, including a first internal signal generating circuit responsive to the first external signal for generating a first internal signal, a second internal signal generating circuit responsive to the first internal signal for generating a second internal signal having a predetermined timing relationship with the second external input signal, the second internal signal generating circuit being responsive to variations in device and environmental parameters such that the time interval between the first and second internal signals is variable, wherein the first internal signal generating circuit is characterized by:

means for causing the time interval between the first input

signal and the first internal signal to vary inversely as the time interval between the first internal signal and the second internal signal in response to the same parameters which cause the time interval between the first internal





signal and the second internal signal to vary so that the occurrence of the second internal signal with respect to the second external input signal is substantially equal to the predetermined timing relationship.

4,433,253

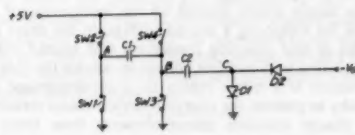
THREE-PHASE REGULATED HIGH-VOLTAGE CHARGE PUMP

John M. Zapisek, Hauppauge, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,591

Int. Cl.³ H03L *5/00*; H03K *17/687*

U.S. Cl. 307—297 **23 Claims**



1. A circuit for applying a bias voltage to a semiconductor substrate, said circuit comprising a first and a second node, charge-coupling means operatively connected between said first and second nodes, a source of a supply voltage, a reference voltage having an absolute value less than said supply voltage, first and second switch means having first terminals operatively connected to said first node and second terminals repectively operatively connected to said reference voltage and to said supply voltage, third and fourth switch means having first terminals operatively connected to said second node and second terminals respectively operatively connected to said reference voltage and to said supply voltage, means for sequentially actuating and deactuating said first, second, third, and fourth switch means in a predetermined time sequence, thereby to alternately charge and discharge said second node between a voltage having a value greater in absolute value than said supply voltage and a voltage nearly equal to the reference voltage, said sequential actuating and deactuating means including means for deactuating said second switch means following the deactuation of said first and fourth switch means and for actuating said third switch means following the deactuation of said second switch means, and a pump circuit operatively connected to said second node and effective to apply a bias voltage corresponding to the voltage swing developed at said second node to the substrate.

4,433,254

LEVEL DETECTING CIRCUIT

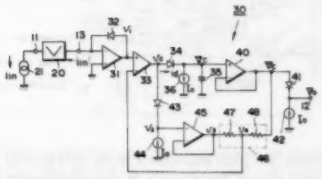
Masayuki Katakura; Kenzo Akagiri, both of Yokohama, and Motomi Ookouchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1981, Ser. No. 325,207

Claims priority, application Japan, Nov. 27, 1980, 55-165848; Dec. 5, 1980, 55-171825

Int. Cl.³ H03K *5/08*

U.S. Cl. 307—350 **20 Claims**



1. A level detecting circuit for producing a level detected output signal in response to an input signal, comprising:

converting means for logarithmically converting said input signal to produce a logarithmically converted signal;

amplifying means supplied with said logarithmically converted signal and at least one feedback signal for producing a logarithmically amplified signal in response thereto;

integrating means for producing an integrated signal in response to said logarithmically amplified signal;

semiconductor means for supplying said logarithmically amplified signal to said integrating means;

feedback means for producing said at least one feedback signal in response to said logarithmically amplified signal and said integrated signal, said feedback means including voltage dividing means for producing said at least one feedback signal in response to said logarithmically amplified signal and said integrated signal, first means for supplying said logarithmically amplified signal to said voltage dividing means, and second means for supplying said integrated signal to said voltage dividing means, said voltage dividing means including a first resistive element and a second resistive element connected in series between said first and second means, said second resistive element having a first resistance and said first resistive element having a second resistance which is $(N-1)$ times the first resistance, $N>2$, and a feedback signal being produced at the connection point between said first and second resistive elements; and

output means for producing said level detected output signal in response to said integrated signal.

4,433,255

SIGNAL SAMPLING GATE CIRCUIT

Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 238,024

Int. Cl.³ H03K *17/60*; G11C *27/02*

U.S. Cl. 307—353 **3 Claims**

1. A signal sampling gate circuit comprising:

a sample signal input terminal to which a sample signal generated from a sampling signal generator is supplied;

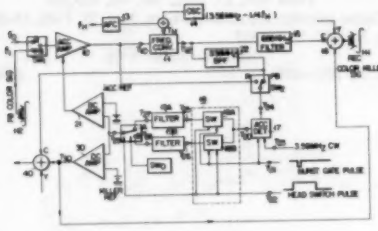
a first hold circuit;

a first sample signal gate circuit for connecting said sample signal input terminal and said first hold circuit in response

to a sampling pulse when in a low impedance state and disconnecting said sample signal input terminal from said first hold circuit in response to said sampling pulse when in a high impedance state;

a second hold circuit;

a second sample signal gate circuit for connecting said sample signal input terminal and said second hold circuit in response to said sampling pulse when in a low impedance state and disconnecting said sample signal input terminal from said second hold circuit in response to said sampling



pulse when in a high impedance state, said second sample signal gate circuit functioning in complementary fashion with respect to said first sample signal gate circuit;

gate circuit driving means for selectively and complementarily driving said first and second sample signal gate circuits in response to a control pulse having a different period than that of said sampling pulse; and

sample signal gate circuit control means for forcing one of said first and second sample signal gate circuits, which is not driven by said gate circuit driving means, to be in a high impedance state in response to said control pulse.

4,433,256

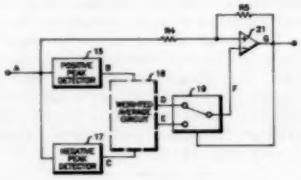
LIMITER WITH DYNAMIC HYSTERESIS

Arman V. Dolikian, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1982, Ser. No. 395,208

Int. Cl.³ H03K *5/08, 5/153*

U.S. Cl. 307—358 **8 Claims**



1. A method for creating a limiter circuit with dynamic hysteresis comprising the steps of:

(1) detecting the positive and negative peaks of as input waveform,

(2) taking at least two weighted averages of said positive and negative peaks,

(3) alternately choosing one of said weighted averages,

(4) comparing said input waveform with said chosen weighted average,

(5) generating a first output signal if the chosen weighted average is greater than the input waveform and generating a second output signal if the chosen weighted average is less than the input waveform.

4,433,257

VOLTAGE SUPPLY FOR OPERATING A PLURALITY OF CHANGING TRANSISTORS IN A MANNER WHICH REDUCES MINORITY CARRIER DISRUPTION OF ADJACENT MEMORY CELLS

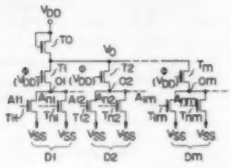
Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

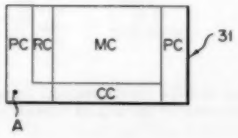
Filed Feb. 24, 1981, Ser. No. 237,699

Claims priority, application Japan, Mar. 3, 1980, 55-26415; Apr. 3, 1980, 55-43870

Int. Cl.³ H03K *3/013, 17/16*

U.S. Cl. 307—443 **29 Claims**





1. A MOS integrated circuit device comprising:

a plurality of charge retention circuit elements formed on a semiconductor substrate;

a peripheral circuit for operation of said charge retention circuit elements having charging transistors which provide logic signals at their source electrodes, said charging transistors being formed on the semiconductor substrate and positioned near to the charge retention circuit elements, a first voltage being applied to the gate electrodes of said charging transistors; and

voltage supply means formed on the semiconductor substrate for supplying a second voltage to the drain electrodes of said charging transistors, said second voltage cooperating with said first voltage to operate the charging transistors in a triode region for a predetermined time thereby to prevent the charge retention characteristics of the charge retention circuit elements from being degraded.

4,433,258

COMPLEMENTARY SCHOTTKY TRANSISTOR LOGIC CIRCUIT

Kenji Kaneko, Hachioji; Takahiro Okabe, Tokyo; Minoru Nagata, Kodaira, and Yutaka Okada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 245,163

Claims priority, application Japan, Mar. 18, 1980, 55-34380

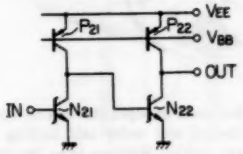
Int. Cl.³ H03K *19/092, 19/088*

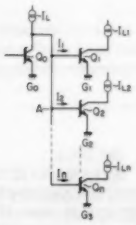
U.S. Cl. 307—456 **12 Claims**

1. A logic circuit comprising a plurality of basic circuits each including at least one single-collector driver transistor provided with a clamping Schottky diode, the emitter of said driver transistor being grounded, the base of said driver transistor being used as an input terminal and the collector thereof being used as an output terminal for said basic circuit, each of said basic circuits further including a constant current load transistor coupled to said output terminal of each said basic circuit, wherein the output terminal of a preceding stage basic

circuit is coupled directly to the input terminal of the subsequent stage basic circuit, said logic circuit further comprising means for adjusting the amplitude of said constant current provided by each of said constant current load transistors to operate the driver transistor of the subsequent stage, with said clamping Schottky diode forward biased, in a shallow saturation mode when said subsequent stage driver transistor is in an ON state.

10. A logic circuit comprising a plurality of basic circuits each including at least one single collector driver transistor provided with a clamping Schottky diode, the emitter of said driver transistor being grounded, the base of said driver transistor being used as an input terminal and the collector thereof being used as an output terminal for said basic circuit, each of said basic circuits further including a constant current load transistor coupled to said output terminal of each said basic circuit, wherein the output terminal of a preceding stage basic circuit is coupled directly to the input terminal of a plurality of subsequent stage basic circuits, said logic circuit further comprising means for adjusting the amplitude of said constant current provided by each of said constant current load transistors to operate each of the driver transistors of the subsequent stages, with their clamping Schottky diodes forward biased, in a shallow saturation mode when said subsequent stage driver transistors are in an ON state.





4,433,259

ELECTRIC ROTATING MACHINE

Toshihiko Okamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,804

Claims priority, application Japan, Dec. 24, 1980, 55-186036[U]

Int. Cl.³ H02K *5/00*

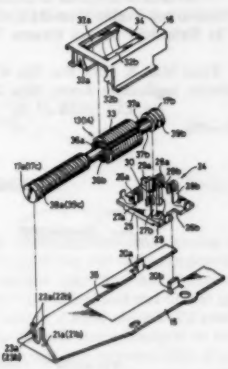
U.S. Cl. 310—89 **18 Claims**

1. An electric rotating machine comprising:

a rotor assembly including a rotor shaft, a rotor magnet disposed on said shaft with radial pole faces thereon, a pair of bearing supporting opposite ends of said shaft, and a rotary motion transmitting element disposed on said shaft;

a base plate having bearing receiving means thereon formed to receive said bearings in directions perpendicular to said base plate when said rotor assembly is displaced toward said base plate with said rotor shaft extending substantially parallel with said base plate; and

a field yoke formed of magnetic material and having at least one field magnet disposed therein with opposite magnetic pole faces facing radially toward each other and being spaced apart in a direction parallel with said base plate by a minimum distance greater than the maximum diametrical dimension of said rotor magnet, said field yoke having



an open side between said pole faces so that said rotor magnet can extend through said open side and in between said pole faces when said field yoke is displaced toward said base plate after the reception of said bearings by said bearing receiving means.

4,433,260

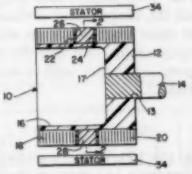
HYSTERESIS SYNCHRONOUS MOTOR UTILIZING POLARIZED ROTOR

Leon E. Weisbord, Secaucus, and Francis W. Wessbecher, Morris Plains, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 12, 1982, Ser. No. 433,714

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **7 Claims**



1. In a hysteresis synchronous motor having a centrally disposed shaft having a longitudinal axis and a stator coaxial with the shaft and a rotor assembly, said rotor assembly comprising:

connecting means for mounting the rotor assembly on the shaft;

first and second hysteresis rings coaxial with the shaft and mounted in axially spaced relationship to each other;

a plurality of peripherally spaced coplanar juxtaposed arcuate-shaped permanent magnets located in radially spaced coaxial relation to the shaft and forming an annular assembly located between the rings, the magnets having similar poles positioned in confronting relation to form a flux distribution around the periphery of the rotor, the distribution characterized by sharp flux peaks in the vicinity of the confronting poles, together with a first and second non-magnetic spacing means located between first and second confronting surfaces of the magnets and axially spaced said first and second hysterisis rings disposed on

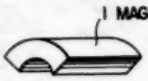
either side thereof for limiting the magnetic shunting effect of the rings.

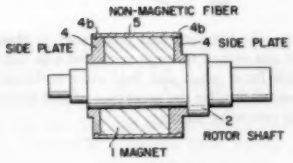
4,433,261

ROTOR FOR PERMANENT MAGNET TYPE SYNCHRONOUS MOTORS

Masayuki Nashiki, and Yoshio Hamada, both of Nagoya, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Nagoya, Japan

Filed Mar. 8, 1983, Ser. No. 473,342
Claims priority, application Japan, Mar. 24, 1982, 57-46603
Int. Cl.³ H02K *21/14*
U.S. Cl. 310—156 **5 Claims**





1. A rotor of a permanent magnet type synchronous motor of the type that a plural number of columnar magnets having sectorial cross section are adhered to a rotor shaft on the outer periphery thereof, which is characterized in that end surfaces of at least one of said magnets are made to project in axial direction, that side plates of non-magnetic material having grooves of the same configuration as the section of said magnets are placed on both sides of said magnets so as to engage the grooves with the magnet end surfaces facing thereto and are fixed to said rotor shaft by means which can prevent circumferential displacement, and that the outer periphery of at least said magnets is wound with non-magnetic fibers and secured with resin.

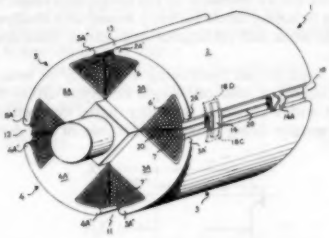
4,433,262

METHOD OF LOCKING CONDUCTORS IN A DYNAMOELECTRIC MACHINE ROTOR AND ROTOR HAVING LOCKED CONDUCTORS

Paul W. Greenlee, Hendersonville, Tenn., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 30, 1978, Ser. No. 965,034
Int. Cl.³ H02K *3/48*
U.S. Cl. 310—214 **7 Claims**

1. In a dynamoelectric machine rotor with a plurality of salient poles and coiled conductors randomly wound on said poles, the improvement comprising a plurality of stiff, deformable locking members each positioned, respectively, to span a predetermined axially limited portion of the coiled conductors in a slot defined by two adjacent poles and to place the opposite ends of each locking member, respectively, under a tip portion of one of said adjacent poles, thereby to place each locking member in compressive engagement against a respective one of said axially limited portions of the conductor to lock them in the slot, the combined axial length of said predetermined axially limited portions comprising less than twenty percent of the axial length of said slot, and including a sheet of insulating paper disposed around the coiled conductors in said slot to insulate them from the poles defining the slot, said sheet of insulating paper being generally coextensive with the walls of said slot immediately adjacent the coiled conductors, except



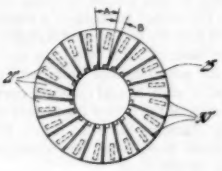
for tab portions of said sheet of paper that extend from at least one of the edges thereof and under said locking members thereby to insulate the locking members from the conductors.

4,433,263

COMMUTATOR HAVING SEGMENTS WITH A VARIED DIMENSION

Richard E. Longhouse; William D. Cornwell, Jr., both of Dayton, and Harry C. Buchanan, Jr., Spring Valley, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1982, Ser. No. 391,127
Int. Cl.³ H02K *13/04*
U.S. Cl. 310—233 **4 Claims**



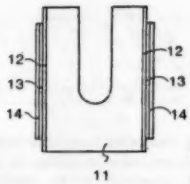
1. A commutator of the type adapted to be rotationally driven by a dynamoelectric machine and having a plurality of spaced, electrically conducting segments adapted to consecutively contact at least one stationary, electrically conducting brush member as the commutator is rotationally driven, each of said segments having a physical dimension (A) determining the relative time duration of brush contact with said segment during said rotation, said commutator being subject to the generation of audible tonal brush noise between said brush and said consecutive segments during said rotation which includes frequency components including a fundamental frequency component at a frequency related to the frequency at which said consecutive segments pass said brush, wherein said physical dimension (A) of said consecutive segments varies from each segment to the next according to a predetermined pattern effective to vary the relative time of brush contact from each segment to the next during said rotation and thus reduce the amplitude of said fundamental frequency component relative to other frequency components, whereby said brush noise is made less tonal in character and thus less annoying.

4,433,264

ELECTRODE STRUCTURE FOR A ZINC OXIDE THIN FILM

Hiroshi Nishiyama, and Takeshi Nakamura, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,828
Claims priority, application Japan, Jun. 30, 1982, 57-114445
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—321 7 Claims



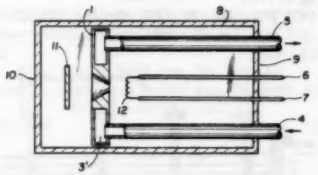
1. An electrode structure for a zinc oxide thin film comprising an electrode and a SnO_2 layer between the surface of the zinc oxide thin film and the electrode.

4,433,265

COOLED DISCHARGE LAMP HAVING A FLUID COOLED DIAPHRAGM STRUCTURE

Helmut Fischer, Hanau; Jürgen Schäfer, Hasselroth, and Günter Thomas, Hanau, all of Fed. Rep. of Germany, assignors to Original Hanau Heraeus GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,104
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923724
Int. Cl.³ H01J *61/34, 61/52, 61/64*
U.S. Cl. 313—22 16 Claims



1. Cooled discharge lamp, particularly for generation of specific spectral output comprising

a closed, gas-tight lamp housing (8, 9, 10) formed with a window (10);

a cathode (12) and an anode (11) positioned in alignment with said window in the housing;

electrical current supply conductors (6, 7) extending through the lamp housing and connected to the cathode,

a metal diaphragm structure (1) formed with a diaphragm opening (2) therethrough and positioned between said cathode and anode, and

metallic cooling fluid supply and removal duct means (4, 5) sealed into and extending through the walls of the lamp housing into the interior thereof,

and wherein the diaphragm structure is disk-like and formed with interior duct means (3, 3',)

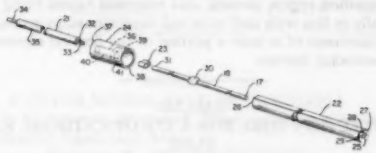
said fluid supply duct means being connected to said interior duct means.

4,433,266

ELECTRICAL IGNITION PROBE MEANS AND METHOD OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robert Shaw Controls Company, Richmond, Va.

Filed Mar. 6, 1981, Ser. No. 241,003
Int. Cl.³ H01T *13/04*; F23Q *3/00, 3/70*
U.S. Cl. 313—135 20 Claims



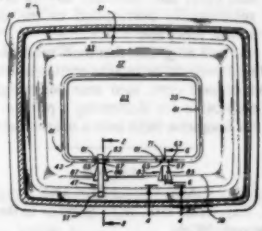
1. In an electrical ignition probe means having an electrode wire provided with a sparking end and an opposed end spliced to an end of an ignition wire that has electrical insulation thereon and disposed inboard of said end of said ignition wire, said probe means having a rigid electrically insulating body provided with opposed ends and telescoped on said electrode wire in such a manner that said opposed ends of said body are respectively disposed inboard of said ends of said electrode wire, and electrically insulating means overlapping adjacent parts of said body and said electrical insulation on said ignition wire to electrically insulate the spliced ends of said electrode wire and said ignition wire, the improvement wherein said insulating means comprises a rigid electrically insulating tubular member having opposed ends and an opening means passing through said opposed ends thereof and telescopically receiving said spliced ends and said adjacent parts of said electrode wire and said ignition wire therein.

4,433,267

CRT INTERNAL CONTACTOR POSITIONING MEANS

Alan T. Kuryla, Geneva; Carl W. Penird, Waterloo, and Peter G. Puhak, Seneca Falls, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,920
Int. Cl.³ H01J *29/06*
U.S. Cl. 313—402 8 Claims



1. An improvement in a cathode ray tube having a longitudinal axis therethrough and an internal magnetic shielding member spatially positioned within the coated funnel portion thereof, said shielding member being formed as a substantially continuous bowl-like sidewall having a substantially full frontal opening and a smaller rear opening defined by the terminal perimeter of a continuous ledge instanding toward said axis from a transition region between said ledge and said sidewall, said ledge having a fluting formed therein adjacent the terminal perimeter thereof; said shielding member having at least one associated longitudinal metallic contactor formed as an integration of a clip-type attachment element, an opposed contact element and an intermediate flexural element, said attachment element being affixed to said fluting to orient said

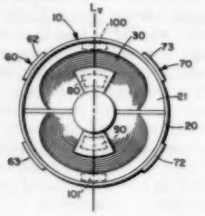
contactor in a position to make electrical connection with said funnel coating, said improvement being positioned means for maintaining accurate placement of said contactor on said shielding member, said means comprising: the combination of a pair of like spatially-related nubs formed of material raised from said fluting at two spaced apart cuts therethrough located on both sides of said contactor; and trough-like retention means formed as an indentation in said ledge and adjacent sidewall portion of said shielding member extending through the transition region thereof, said retention means being substantially in line with said nubs and dimensioned to accommodate placement of at least a portion of the flexural element of said contactor therein.

4,433,268

DEFLECTION YOKE FOR A COLOR CATHODE RAY TUBE

Junichi Arisato, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,156
Claims priority, application Japan, Aug. 20, 1980, 55-114523
Int. Cl.³ H01F *3/12*
U.S. Cl. 313—440 **6 Claims**



1. A deflection yoke for a color cathode ray tube having a substantially rectangular screen comprises:

a substantially cylindrical core surrounding said tube;

a pair of horizontal deflection coils between said tube and said core for generating a horizontal deflection magnetic field having a pincushion distribution;

a pair of vertical deflection coils wound around said core and facing each other for generating a vertical deflection magnetic field having a pincushion distribution;

front end magnetic members mounted at the large diameter end of said core; said members having arms at positions which substantially correspond to the corners of said screen of said tube; and

a pair of rear end magnetic members mounted between said tube of said vertical deflection coils and at the small diameter end of said core, said rear end magnetic members facing each other for deforming a portion of the vertical deflection magnetic field into a barrel distribution.

4,433,269

AIR FIREABLE INK

Nicholas W. Kay, Mine Hill, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,581
Int. Cl.³ H01J *17/00*
U.S. Cl. 313—632 **6 Claims**

1. An ink formulation for forming conductive elements by a screening operation including in percent by weight, nickel 34–55; aluminum 10–14; aluminum/silicon alloy 18–24; lead glass frit binder 16–20; and a vehicle 12–14, the nickel having an average particle size of about one micron; the aluminum having an average particle size of about three microns; and the aluminum/silicon alloy having a particle size in the range of five to ten microns.

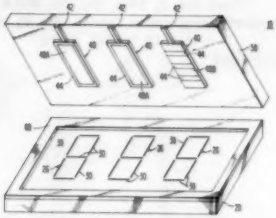
4. A display panel comprising

a gas-filled envelope made up of a base plate and a glass face plate hermetically sealed together to form said envelope which is filled with an ionizable gas,

at least one glow cathode electrode in said envelope,

a transparent conductive anode electrode on said face plate inside said envelope positioned in operative relation with said cathode electrode, and

a reinforcing conductor in contact with at least a portion of said anode electrode,



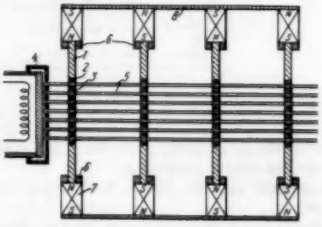
said reinforcing conductor being screened on said face plate with an ink formulation including in percent by weight, nickel 34–55, aluminum 10–14, aluminum/silicon alloy 18–24, lead glass frit binder 16–20, and a vehicle 12–14, the nickel having an average particle size of about one micron, the aluminum having an average particle size of about three microns, and the aluminum/silicon alloy having a particle size in the range of five to ten microns.

4,433,270

REVERSIBLE PERIODIC MAGNETIC FOCUSING SYSTEM

Sergei S. Drozdov, ulitsa Narodnogo Opolchenia, 24, korpus 1, kv. 104; Mikhail V. Kiselev Dmitriev, Domodedovskaya ulitsa, 11, Korpus, Kv. 12; Sergei V. Lebedinsky, Profsojuznaya ulitsa, 46, Korpus 2, Kv. 31; Sergei N. Nazarov, ulitsa Dnepropetrovskaya, 23, Korpus 3, Kv. 47; Jury V. Lavrentiev, ulitsa Kakhovka, 10/12, Korpus 1, Kv. 21; Pavel V. Nevsky, Profsojuznaya ulitsa, 49, Korpus 1, Kv. 89; Nina V. Kutasheva, ulitsa Bolshaya Gruzinskaya 20, Kv. 16, all of Moscow, U.S.S.R.

PCT No. PCT/SU80/00008, § 371 Date Aug. 17, 1981, § 102(e) Date Aug. 17, 1981, PCT Pub. No. WO81/02221, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 28, 1980, Ser. No. 293,627
Int. Cl.³ H01J *23/08*
U.S. Cl. 315—5.35 **17 Claims**



1. A reversible periodic magnetic focusing system to increase the perveance of the electron flow comprising:

a successive arrangement of permanent magnets magnetized in an opposite sense;

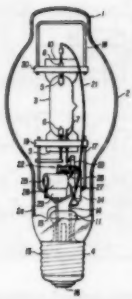
magnetically soft pole shoes interposed between the permanent magnets, each pole shoe having a hole for passage of an electron flow; and

grids with meshes, receives in the holes of said pole shoes, said grids being of a magnetically soft material and having magnetic, thermal and electric contact with the pole shoes, the respective meshes of the grids of the pole shoes being arranged coaxially.

4,433,271
HIGH PRESSURE DISCHARGE LAMP

Akihiro Inoue, Chigasaki, and Akihiro Kamiya, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1981, Ser. No. 264,408
Claims priority, application Japan, Jul. 15, 1980, 55-99852[U]
Int. Cl.³ H01J *17/34;* H05B *41/08*
U.S. Cl. 315—63 **5 Claims**

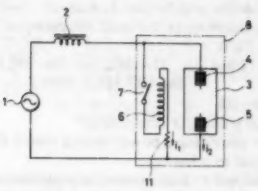


1. A high pressure discharge lamp comprising;
a discharge tube having a main electrode at each end thereof;
an outer bulb housing said discharge tube;
a circuit for starting said discharge tubes; and
a glow starter covered with a heat shield member and disposed between said discharge tube and said outer bulb wherein said heat shield member comprises a heat insulating covering member wrapped around a major portion of the surface area of said glow starter and a mounting member engaging said covering member whereby said glow starter is subject to decreased heat radiation from said discharge tube and whereby said glow starter is protected from heat during the manufacturing of said lamp.

4,433,272
HIGH-PRESSURE DISCHARGE LAMP

Soichiro Ogawa, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,142
Claims priority, application Japan, Aug. 18, 1980, 55-112743
Int. Cl.³ H05B *41/18*
U.S. Cl. 315—290 **5 Claims**



1. In a high-pressure discharge lamp in which a starting circuit, consisting of a thermal switch and a resistor connected in series, is connected in parallel with an arc tube, and said arc tube is connected to a power supply via a mercury lamp ballast connected in series with said arc tube, the improvement comprising means for controlling the starting current i_1 of the starting circuit and the current i_2 of the arc tube according to the following relationship:

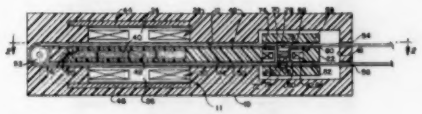
$$i_1/i_2 \leqq 0.69 \times 10^{-3} X + 0.24$$

wherein
$X \leqq 200$,
where i_1 denotes the current in amps that flows into said starting circuit when the lamp is to be turned on, i_2 denotes the current in amps that flows into said arc tube after the lamp is turned on, and X denotes the output power in watts of said ballast.

4,433,273
CAMERA MOTOR BELT DRIVE SYSTEM

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 21, 1982, Ser. No. 341,202
Int. Cl.³ H02K *4/00, 7/06;* G03B *1/22, 17/50*
U.S. Cl. 318—135 **14 Claims**



1. A stepper drive system comprising:
a frame, and
a carriage mounted for reciprocable movement along a given path in said frame, said frame and carriage including a linear motor energizeable for reciprocally driving said carriage between given limits within said frame;
at least one linear belt flight;
means for guiding said belt flight longitudinally of said frame along at least a portion of both sides of said carriage;
belt flight engaging means mounted on said carriage within said guided belt, said engaging means being selectively energizeable for engaging said belt flight at either side of said carriage; and
means for energizing said motor and said engaging means for synchronizing movement of said carriage with operation of said belt engaging means to advance said one belt flight through a succession of steps upon continuous reciprocal carriage movement, said energizing means including means for energizing said engaging means to alternately engage said belt flight along opposing sides of said carriage in synchronism with the alternate direction of movement of said carriage.

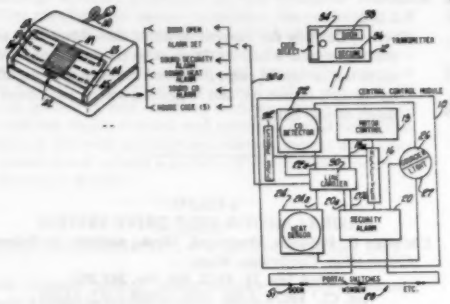
4,433,274
HOME SECURITY AND GARAGE DOOR OPERATOR SYSTEM

Dean C. Duhame, 19836 Jerome, Apt. 238, Roseville, Mich. 48066

Division of Ser. No. 140,045, Apr. 14, 1980, Pat. No. 4,360,801. This application Jul. 27, 1981, Ser. No. 287,336
Int. Cl.³ H02H *7/085*
U.S. Cl. 318—283 **1 Claim**

1. In a garage door operator of the type having a door drive motor, an overload switch for the motor, an integrated security alarm system, and a power supply normally connected to both the motor and the alarm system, the improvement comprising:
circuit means interconnecting the power supply, the motor, the overload switch and the alarm system including detector means for monitoring the condition of the overload switch and providing a first logical signal level to the

motor and to the alarm system to maintain normal operation thereof but responsive to the opening of said overload



switch to provide a second logical signal level which selectively disables only the motor.

4,433,275

THREE-DIMENSIONAL TRACER CONTROL SYSTEM

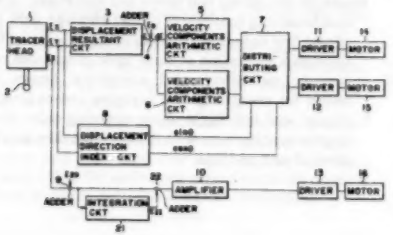
Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,592

Claims priority, application Japan, Jun. 3, 1980, 55-74832

Int. Cl.³ H02P *7/06*

U.S. Cl. 318—578 **2 Claims**



1. A three-dimensional tracer control system which traces the configuration of a model based on direction displacement signals from a tracer head, said system comprising:

said tracer head providing X- , Y- and Z-axis direction displacement signals as said direction displacement signals;

X-Y means for controlling the tracing of said tracer head in the X-Y plane according to said X- and Y-axis direction displacement signals and a desired value of a function thereof;

an integration circuit for integrating the difference between said Z-axis direction displacement signal and a desired value thereof;

an adder for adding together said difference and the output from said integration circuit; and

means for controlling the trace velocity in the Z-axis direction in accordance with the output signal from said adder.

4,433,276

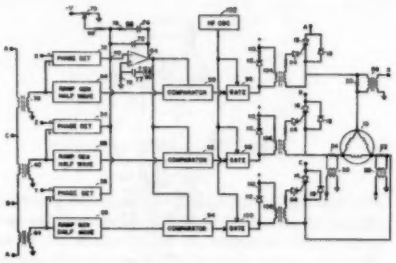
THREE PHASE POWER FACTOR CONTROLLER

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 199,765, Oct. 23, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 476,244

Int. Cl.³ H02P *7/36*

U.S. Cl. 318—729 **21 Claims**



1. A power factor control system for a three phase A.C. induction motor comprising:

first, second and third phase detection means for sampling the current and voltage in each of said three phases and providing discrete outputs wherein each is proportional to the in-phase state of one discrete phase;

summing means for combining the three current-voltage state outputs of said detection means and providing a current-voltage state signal at three times the rate of a sample from one of said phases;

means for providing a power factor command signal;

difference means for subtracting said command signal from said current-voltage state signal to provide a difference signal;

signal conditioning means responsive to said difference signal for providing a control signal which is essentially smooth with respect to the average value of said current-voltage state signal, but includes changes occurring at a change in motor loading; and

control means, including switching means connected in series with each phase input of said motor, said switching means being responsive to said control signal for varying the "on" time of each cycle of input power to a said phase input as a direct function of load on a said motor.

4,433,277

BATTERY CHARGING SYSTEM

James A. Carollo, and Wayne A. Kalinsky, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 21, 1982, Ser. No. 390,151

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—24 **10 Claims**

1. A battery charger comprising:

means for providing a power source which delivers a charging signal to a battery;

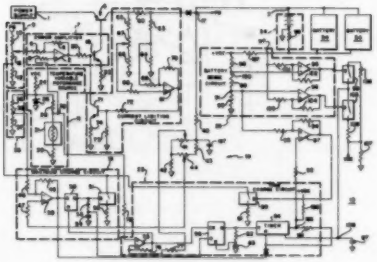
means coupled to said means for providing a power source and responsive to a control signal for controlling the charging signal delivered to a battery to be one of a first charging signal, a second maintenance charging signal and a third charging signal;

first means for providing a first reference signal representative of a first predetermined charge level of a battery;

second means for providing a second reference signal which is variable in accordance with the temperature of a battery and is representative of a second predetermined charge level of a battery;

means for sensing the charge level of a battery and providing a charge level output signal;

means responsive to said charge level output signal and said first reference signal for providing a control signal to said means for controlling and causing it to deliver a first charging signal when said battery charge level is less than said first predetermined charge level and a second maintenance charging signal when said battery charge level is equal to or greater than said first predetermined charge level;



means responsive to said charge level output signal and said second reference signal for detecting when a battery charge level equals said second predetermined charge level and providing a control signal to said means for controlling and causing it to deliver a third charging signal for a predetermined charge period; and

means responsive to the termination of said predetermined charge period for providing a control signal to said means for controlling and cause it to deliver said second maintenance charging signal.

4,433,278

BATTERY STATE OF CHARGE EVALUATOR SYSTEM

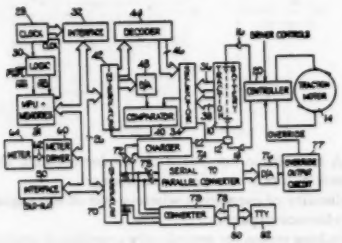
Michael W. Lowndes, Moseley; Derek S. Adams, Solihull, and Neville J. Arlidge, Kings Heath, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 18, 1980, Ser. No. 208,097

Claims priority, application United Kingdom, Jun. 28, 1980, 8021285

Int. Cl.³ G01R *29/24*; H02J *7/00*

U.S. Cl. 320—48 **16 Claims**



1. A state of charge evaluator system comprising:

a traction battery pack having a plurality of cells connected in series and divided into a plurality of sub-packs each of which includes one or more cells;

means connected across the individual sub-packs for measuring the voltages of the individual sub-packs;

means for selecting the sub-pack having the lowest voltage; and

means for determining the state of charge of the battery pack, said means using the voltage of said sub-pack having the lowest voltage for determining the state of charge in the last part of discharge and producing a signal which is representative of the amount of charge remaining in the battery pack.

4,433,279

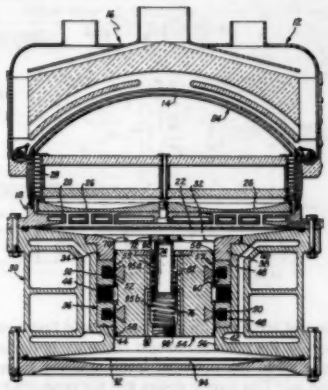
FREE PISTON HEAT ENGINE STABILITY CONTROL SYSTEM

Suresh K. Bhate, Niskayuna, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,460

Int. Cl.³ H02K *35/00*; H02P *9/04*

U.S. Cl. 322—3 **4 Claims**



1. A stability control system for a Free Piston Stirling Engine driving a linear alternator having field windings and an armature in the form of a plunger and wherein said alternator output voltage is a function of plunger stroke and current in the field windings, and the engine power is a function of plunger stroke, comprising:

an electrical circuit coupled between the output of said alternator and the input of said field windings for controlling the current to said field windings as a function of said alternator output voltage so that the change in power demand of said alternator with change in stroke is greater than the change in power supplied by said engine with changes of stroke, whereby said Free Piston Stirling Engine operation is stable.

4,433,280

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Timothy F. Lindgren, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 101,762, Dec. 10, 1979, Pat. No. 4,317,437. This application Dec. 14, 1981, Ser. No. 330,666

Int. Cl.³ F02P *5/08*, *1/00*

U.S. Cl. 322—89 **1 Claim**

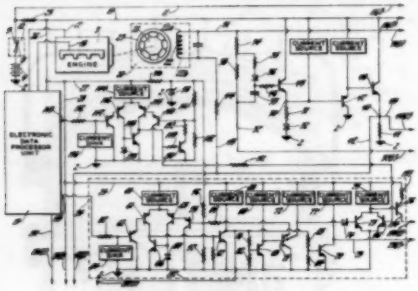
1. In combination with an electrical generator assembly of the type having at least a rotatable rotor member and an output coil in which a series of alternating current signals is magnetically induced while the rotor member is rotated, a circuit for producing an output signal upon a selected polarity transition of each cycle of the series of alternating current signals comprising:

means for producing a reference potential signal of a first potential level that is of a first selected incremental potential value greater than the potential level upon a selected first terminal end of said electrical generator assembly output coil;

first circuit means effective when activated to increase said reference potential signal to a second potential level that is

of a second selected incremental potential value greater than said first potential level; and

means responsive to said reference potential signal and the potential level upon the other second terminal end of said electrical generator assembly output coil for deactivating said first circuit means when the potential upon said other second terminal end of said electrical generator assembly output coil has attained a level substantially equal to that of said reference potential signal resulting from the activated said first circuit means whereby the potential level of said reference potential signal is reduced to said first



potential level and for reactivating said first circuit means whereby the potential of said reference potential signal is increased to the potential level resulting from the activated said first circuit means and for producing an output signal when the potential upon said other second terminal end of said electrical generator assembly output coil has attained a level substantially equal to that of said reference potential signal of said first potential level whereby an output signal is produced upon a selected polarity transition of each cycle of said alternating current signals produced by said electrical generator assembly.

4,433,281

METHOD FOR DETECTING BREAKDOWNS IN AN ELECTROSTATIC FILTER

Helmut Herklotz, Neu Isenburg; Günter Mehler, Frankfurt am Main; Franz Neulinger, Dietzenbach; Helmut Schummer, Heusenstamm; Horst Daar, Erlangen; Walter Schmidt, Uttenreuth, and Heinrich Winkler, Neunkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

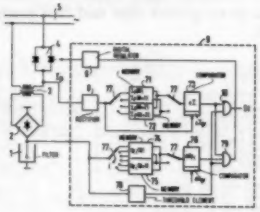
Filed Dec. 4, 1980, Ser. No. 213,031

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949752

Int. Cl.³ G05F *1/455*

U.S. Cl. 323—246 **4 Claims**

1. In a method for detecting breakdowns in an electrostatic filter which is fed from an a-c voltage source via a rectifier, a high-voltage transformer and a final control element, and wherein the overstepping of a given difference voltage value of single measured values of equal phase position of successive half waves of the filter d-c voltage is used as breadown criterion, the improvement comprising presetting the difference



voltage value as a percent of the respective measured filter voltage.

4,433,282

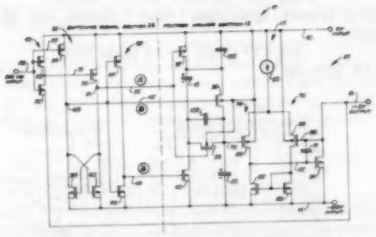
MONOLITHIC VOLTAGE DIVIDER

David R. Squires, Los Altos, Calif., assignor to Intersil, Cupertino, Calif.

Filed Dec. 8, 1981, Ser. No. 328,519

Int. Cl.³ G05F *1/56*

U.S. Cl. 323—281 **20 Claims**



1. A monolithic integrated circuit for dividing the voltage supplied by a power supply comprising:

a plurality of capacitors wherein one of the capacitors is a reference capacitor;

switching means for periodically coupling at least two of the capacitors in series to the power supply during a first time period and for periodically coupling at least two of the capacitors in parallel during a second time period such that the voltage across one of the capacitors provides a reference voltage which approaches a predetermined fraction of the supply voltage of the power supply; and

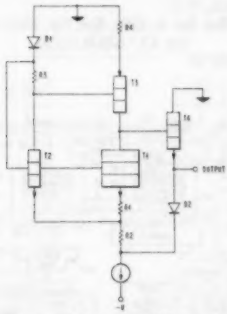
a voltage regulator having an input operably connected to the capacitor providing the reference voltage, and an output which provides a supply voltage at the predetermined fraction of the power supply, said voltage regulator having an input impedance in excess of 10 meghoms to minimize loading of the capacitors.

4,433,283

BAND GAP REGULATOR CIRCUIT

John E. Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,889
Int. Cl.³ G05F 3/20
U.S. Cl. 323—314 19 Claims



1. A band gap regulator comprising a transconductance amplifier including first and second transistors, each having an emitter, a resistive network, a load circuit and a current source, and,

a negative feedback circuit coupled to the emitters of said transistors through said resistive network,

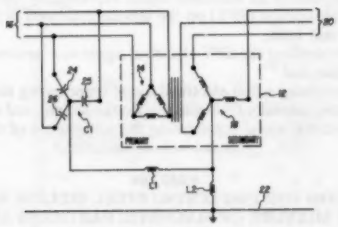
said load circuit and said feedback circuit each having an impedance with a similar temperature coefficient of voltage and said current source being connected to said feedback circuit and to said resistive network.

4,433,284

POWER LINE COMMUNICATIONS BYPASS AROUND DELTA-WYE TRANSFORMER

William C. Perkins, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 7, 1982, Ser. No. 366,127
Int. Cl.³ H04B 3/56
U.S. Cl. 323—361 7 Claims



1. A circuit for bidirectionally bypassing a delta-wye transformer, having a primary-to-secondary voltage ratio R, with a communication signal having a carrier frequency, which signal is to be transmitted as a balanced phase-to-neutral signal on three-phase lines on the delta windings side of the transformer and on the wye windings side thereof, comprising:

a set of three capacitors, each having one side thereof connected at a node to form a wye configuration, and each having the other side connected to a different one of the lines on the delta side of the transformer;

an inductor with inductance L1 connected between the node of the wye configuration of capacitors and the common node of the wye windings of the transformer; and

an inductive reactor with inductance L2 connected from the node of the wye windings of the transformer to a common neutral for the three phase lines,

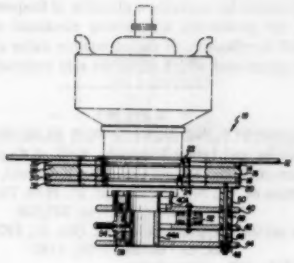
said capacitors, inductor and inductive reactor being selected with values so that the parallel combination of the capacitors is substantially resonant at the carrier frequency with the series combination of L1 and L2.

4,433,285

INTEGRATED TUBE SOCKET ASSEMBLY

Joseph W. Rayburn, Bowie, Md., assignor to Arinc Research Corp., Annapolis, Md.

Filed May 13, 1982, Ser. No. 377,801
Int. Cl.³ H01J 19/62
U.S. Cl. 323—364 6 Claims



1. A socket assembly for removably supporting a tube and providing electrical connection therewith comprising:

a first contact means for connection to a first filament connector on a tube;

a second contact means for connection to a second filament connector on a tube, said first and second contact means being adapted to be electrically connected with a tube filament so as to cause electric currents to flow therethrough;

a third contact means for receiving a signal;

a plurality of capacitors positioned between said third contact means and said first and second contact means, respectively, said capacitors being so positioned that a signal travelling from said third contact means simultaneously to said first and second contact means will travel substantially an equal distance to the filament within a tube from which the signal is transmitted;

whereby a signal travels from said third contact means to said filament substantially simultaneously through said first and second contact means through respective capacitors such that distortion is minimized.

4,433,286

IDENTIFICATION OF MATERIALS USING THEIR COMPLEX DIELECTRIC RESPONSE

William D. Gregory, Vienna; Larry H. Capots, Annandale; Luigi Morelli, Sterling, all of Va.; John Muhlke, III, Bethesda, and Thomas A. Nolan, Jr., Chevy Chase, both of Md., assignors to Georgetown University, Washington, D.C.

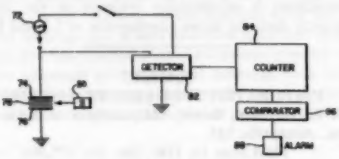
Division of Ser. No. 28,452, Apr. 9, 1979. This application Aug. 10, 1979, Ser. No. 65,440
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R 6 Claims

3. Apparatus for identifying materials having frequency-responsive conductive and/or dielectric properties, comprising:

(a) capacitive means for producing a capacitive output signal and for producing a change in capacitive value when said material is placed in physical association therewith, said capacitive means including a capacitive element connected in series;

(b) capacitive response means connected with said capaci-

tive element for evaluating the change of capacitive value from the capacitive means, said capacitive response means including a detector; and



(c) frequency generating means connected across said capacitive means for applying a plurality of frequencies thereto, and for producing a balanced electrical output signal which is reflective of the capacitive value of the capacitive means and which identifies said material.

4,433,287

RANGE SWITCHING DEVICE FOR ELECTRIC METER

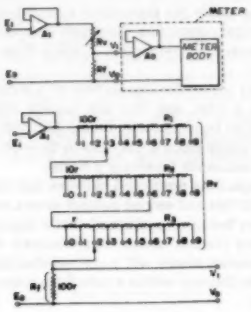
Akiro Morita, and Isamu Watanabe, both of Kawasaki, Japan, assignors to Riken Denshi Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 37,017, Apr. 27, 1979. This application Mar. 10, 1981, Ser. No. 242,228

Claims priority, application Japan, Oct. 12, 1978, 53-124617

Int. Cl.³ G01R *15/08, 1/30*

U.S. Cl. 324—115 **4 Claims**



1. A range switching device for a voltage measuring electric meter, said device comprising input terminals for the voltage signal to be observed, an impedance converting operational amplifier high in input impedance but low in output impedance having its input connected to one of said input terminals, and a variable resistance and a fixed resistance connected in series between the output of said amplifier and said other input terminal, said electric meter being connected across the ends of said fixed resistance through an impedance converting operational amplifier to impart high input impedance thereto, said variable resistance comprising a succession of groups of resistors with the resistors in each such group corresponding in number and being connected in series, the individual resistors of each such group having the same resistance value while the resistance values of the resistors in said successive groups are successive multiples to a common base number of the fixed resistance value, switching contacts in the connections between adjacent pairs of individual resistors in each such group and at the respective ends of the series of each such group, a switch for each said group arranged for switching between the switching contacts for that group, and means connecting one end of the first of said resistor groups in such said succession of groups to said amplifier output, means connecting one end of each of the second through the last of such groups to the switch for the next preceding group, and means connecting the switch for the last of said groups to the end of said fixed resistance.

4,433,288

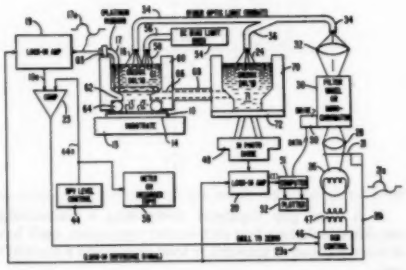
METHOD AND APPARATUS FOR DETERMINING MINORITY CARRIER DIFFUSION LENGTH IN SEMICONDUCTORS

Arnold R. Moore, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,918

Int. Cl.³ G01R *31/26*

U.S. Cl. 324—158 D **31 Claims**



1. A method for determining the minority carrier diffusion length of a sample of semiconductor material, the sample having two major surfaces, one of the surfaces arranged for illumination and the other surface shielded from illumination including the steps of:

(a) covering a portion of the one major surface of the sample with an electrolyte solution containing redox couples having redox (oxidation-reduction) potential in the range of +0.6 to −1.65 volts, said electrolyte solution being soluble, stable and non-reactive to the semiconductor material and free of solid or gaseous products and forming a liquid Schottky barrier at said surface portion;

(b) illuminating a portion of the one major surface of the sample with monochromatic light that is of a selected wavelength by passing said light through said redox couple solution;

(c) providing an electrical signal representing the surface photovoltage (SPV) on the sample generated in response to said light;

(d) controlling the SPV electrical signal to a predetermined value; and

(e) providing a first electrical signal representing the illuminating intensity (I) incident upon the sample, and a second electrical signal representing the wavelength of the light.

4,433,289

METHOD FOR INSPECTING STEEL BILLETS WITH A DRY MIXTURE OF MAGNETIC PARTICLES AND A WATER SOLUBLE CARRIER SOLID

Adolf Mlot-Fijalkowski, Lincolnwood, and Paul K. Borrows, Schaumburg, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Jan. 15, 1981, Ser. No. 225,312

Int. Cl.³ G01N *27/84;* **G01R** *33/12;* **H01F** *1/28*

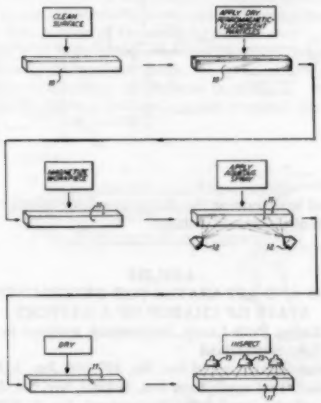
U.S. Cl. 324—215 **5 Claims**

1. A method for inspecting a magnetizable workpiece which comprises:

applying to the surface of said workpiece a dry mixture of magnetic particles containing a fluorescent pigment adhered thereto and a water-soluble carrier solid capable of adhering to the surface upon activation by an aqueous medium,

magnetizing said workpiece to cause the magnetic particles

to adhere to surface imperfections while carrying the fluorescent pigment to such imperfections thereby providing indications of the location of such imperfections,



applying an aqueous spray to said indications to activate said carrier solid into an adhesive bonding said particles to said imperfections, and

drying the workpiece to cause setting of the activated adhesive and provide fluorescent pigment at such indications.

4,433,290

MAGNETIC COATING THICKNESS COMPARATOR HAVING PARALLEL MAGNETIC RODS WITH NONMAGNETIC SLIDE INDICATORS

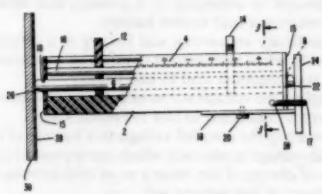
Frank Koch, Ogdensburg, N.Y., assignor to DeFelsko Corporation, Ogdensburg, N.Y.

PCT No. PCT/US82/01602, § 371 Date Jul. 7, 1983, § 102(e) Date Jul. 7, 1983, PCT Pub. No. WO83/01833, PCT Pub. Date May 26, 1983

Continuation-in-part of Ser. No. 320,508, Nov. 12, 1981, abandoned. This PCT application Nov. 12, 1982, Ser. No. 514,766

Int. Cl.³ G01B *7/10*; G01R *33/12*

U.S. Cl. 324—230 **21 Claims**



1. A coating thickness comparator comprising:

(a) a permanent rod magnet having a middle, a reference pole and a measuring pole;

(b) a ferromagnetic rod arranged parallel to said permanent rod magnet;

(c) first and second nonmagnetic slides supporting said permanent rod magnet and said ferromagnetic rod and maintaining said rods substantially parallel to one another said slides being arranged for longitudinal movement along said rods;

(d) a housing including means for indicating said middle of said permanent rod magnet; and

(e) a standard ferromagnetic base abutting said reference pole, and a ferromagnetic base having a coating thereon abutting said measuring pole;

a position of said nonmagnetic slides when pushed together to coincide indicating a thickness of said coating.

4,433,291

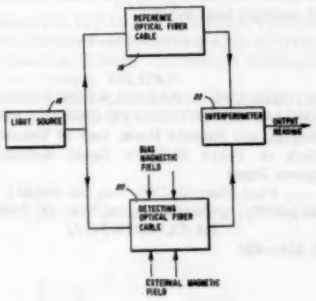
OPTICAL FIBER FOR MAGNETOSTRICTIVE RESPONSIVE DETECTION OF MAGNETIC FIELDS

Amnon Yariv, San Marino, Calif., and Harry V. Winsor, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1981, Ser. No. 223,635

Int. Cl.³ G01R *33/02*; G02B *5/14*

U.S. Cl. 324—244 **18 Claims**



7. A detector for detecting the presence of a magnetic field comprising:

a light transmission means for transmission of light therethrough,

a magnetostrictive means magnetostrictively responsive to a magnetic field circumpositionally and superjacently covering the light transmission means about the cross-section of the light transmission means and along a length of the light transmission means for changing the optical path length of the light transmission means along the physical length of the light transmission means in response to the magnetic field, and

a means sensitive to the effect upon the light transmission of the light transmission means in response to the magnetic field for determining the presence of the magnetic field.

4,433,292

ARRANGEMENT OF A POLYCHROME CATHODE-RAY TUBE FOR OPERATION WITH A RESERVED ELECTRON GUN

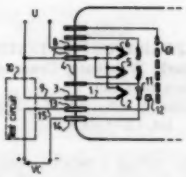
Jean Claude Frebault, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 4, 1981, Ser. No. 260,102

Claims priority, application France, May 8, 1980, 80 10247

Int. Cl.³ G01R *31/024*

U.S. Cl. 324—404 **7 Claims**



1. A polychrome cathode-ray tube comprising:

three electron guns, each gun having a heated filament, and a cathode with an emission surface for emitting electrons;

a base fitted with contact pins, said filaments being connected in parallel to a first and a second of said contact-pins, said cathodes being respectively connected to a third, a fourth and a fifth of said contact-pins;

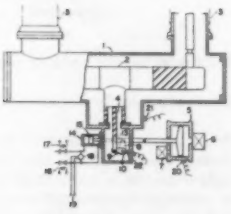
and means for performing an external check on emission of one of the three electron guns and for indirectly checking at the same time heating of said one gun, said checking means comprising an ancillary test circuit and an additional electrode constitution an anode inserted in proximity to the cathode and intermediate the cathode and grid of said one gun so as to form a diode with said cathode, said anode being connected to a sixth contact-pin within the interior of the tube, said sixth pin being adapted to be connected externally to an associated supply circuit via said ancillary test circuit.

4,433,293

METHOD AND APPARATUS FOR DETECTING ABNORMAL CONDITIONS OF CIRCUIT BREAKERS

Akira Aoyagi, and Shinichi Ikeda, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 20, 1981, Ser. No. 246,061
Claims priority, application Japan, Mar. 31, 1980, 55-40250
Int. Cl.³ G01R *31/32*
U.S. Cl. 324—424 **5 Claims**



2. An apparatus for detecting an improper operation condition of a circuit breaker having contacts provided inside a casing, at least one of which is movable, for opening and closing a circuit in an electric power line, said circuit breaker including an operating mechanism for operating said movable contact, said apparatus comprising:

means for driving said movable contact at a significantly lower speed than the speed with which said movable contact moves during a normal, in use, contact opening or closing operation of said circuit breaker;

a plurality of measuring units mounted on said casing for measuring a plurality of examination data and producing electric signals representing said measured examination data; and

means for displaying said electric signals for comparison.

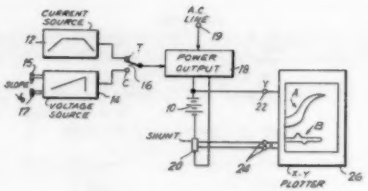
4,433,294

METHOD AND APPARATUS FOR TESTING A BATTERY

Robert W. Windebank, Woodbury, Conn., assignor to Firing Circuits, Inc., Norwalk, Conn.

Filed Jun. 5, 1981, Ser. No. 270,823
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—426 **34 Claims**

25. Apparatus for testing a battery comprising energizing means coupled to said battery to selectively supply current and voltage thereto; sensing means coupled to said battery to sense voltage thereacross; and data processing means programmed to control said energizing means to supply a gradually increasing current followed by a gradually decreasing current to said



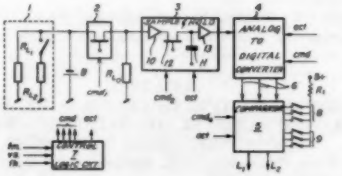
battery and to determine the charge condition of said battery as a function of the sensed voltage.

4,433,295

PROCESS AND APPARATUS FOR DETERMINING THE STATE OF CHARGE OF A BATTERY

Edmond Zaugg, Petit-Lancy, Switzerland, assignor to Montres Rolex S.A., Switzerland

Continuation-in-part of Ser. No. 337,105, Jan. 5, 1982, abandoned. This application Jan. 8, 1982, Ser. No. 338,153
Claims priority, application Switzerland, Jan. 5, 1981, 13/81
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—429 **22 Claims**



1. A process for determining the state of charge of a battery supplying electrical power to an instrument of the type which includes a current consuming component having at least two consumption levels, one of said levels being a minimum current consumption level defined as a minimum load and a second of said levels being a maximum consumption level defined is a maximum load, said process comprising the steps of:

(a) monitoring the load condition of said current consuming component to determine if it presents said minimum or said maximum load to said battery;

(b) periodically connecting said battery to a reference load but only when said current consuming components presents said minimum load to said battery;

(c) sampling the voltage across said reference load when said battery is connected to said reference load;

(d) comparing the sampled voltage to a number of predetermined voltage levels each which correspond to a different state of charge of the battery so as to determine the state of charge of the battery; and

(e) generating at least one output signal which indicates a state of charge of the battery as determined by said comparing step.

4,433,296

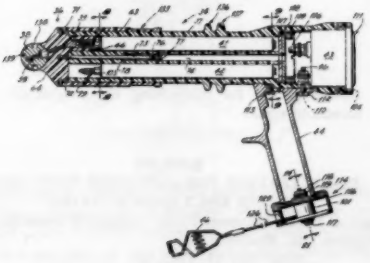
ELECTROSTATIC SYSTEM ANALYZER

James A. Kolibas, Broadview Heights, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 22, 1981, Ser. No. 285,740
Int. Cl.³ G01N *27/60*
U.S. Cl. 324—452 **10 Claims**

1. An analyzer for a high voltage electrostatic coating system comprising:

an analyzer body of a generally insulating material having a first and a second portion, the two portions being positionable relative to one another;
a spherical conductive ball electrode removably received on said first portion of said analyzer body, contactable with test points of the electrostatic coating system, mounted on said first portion of the analyzer body;
a plurality of high voltage resistors mounted in said second portion of the analyzer body;
means for connecting the resistors in series;
an ammeter having first and second terminals for coupling



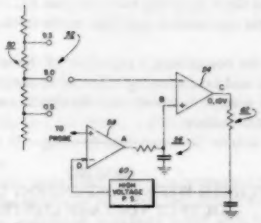
current therethrough, said first terminal being coupled to an end of said series-connected resistors;
means for coupling said second terminal of said ammeter to an electrical ground; and
means for selectively coupling said electrode to different resistors of said plurality of resistors dependent upon the relative position between said first and second portions of said analyzer body, wereby the resistance between said electrode and said ammeter may be varied to compensate for resistance variations among test points of an electrostatic coating system by varying the relative position between said first and second analyzer body portions.

4,433,297

TIME AVERAGED AMPLITUDE COMPARISON ELECTROMETER

Robert F. Buchheit, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 276,235
Int. Cl.³ G01R *29/12*
U.S. Cl. 324—457 **11 Claims**



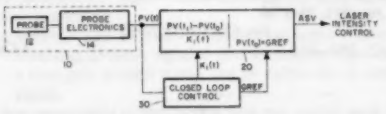
1. Apparatus for measuring charge potentials on an electrostatic surface comprising
a voltage divider,
a selector switch connected to the voltage divider for selecting a voltage level,
an electrometer probe and input amplifier disposed adjacent the electrostatic surface,
a variable high voltage power supply communicating with the probe and input amplifier, a voltmeter connected across the variable high voltage power supply to measure a discrete voltage level, and
control circuitry including a comparator, the input of the comparator connected to the selector switch and the input amplifier, and
a filter network, the output of the comparator connected to the input of the filter network, the output of the filter network connected to the variable high voltage power supply whereby upon suitable selection of voltage levels by the selector switch, the discrete voltage level can be determined in response to variable voltage levels on the electrostatic surface being sensed by the electrometer probe.

4,433,298

CALIBRATED APPARENT SURFACE VOLTAGE MEASUREMENT APPARATUS AND METHOD

Charles S. Palm, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.

Filed Nov. 12, 1981, Ser. No. 320,184
Int. Cl.³ G01R *29/12*
U.S. Cl. 324—457 **15 Claims**



1. Apparatus for measuring the apparent surface voltage (ASV) on an electrostatic/electrophotographic imaging medium (such as the photoconductive surface of an electrophotographic drum) using a relatively low cost ASV probe, periodically recalibrating probe sensitivity to compensate for variations in environmental and electrical conditions such as temperature, relative humidity, and electrical circuit performance, the calibrated ASV measurement apparatus comprising:
(a) a probe, including a sensing head with a defined sensing field, responsive to ASV on the imaging medium to provide (for a given probe-to-medium spacing) a probe voltage output PV according to the following relation:

$$PV = K_1(t) \cdot ASV + F(t)$$

where probe sensitivity $K_1(t)$ varies over time due to changes in environmental and electrical conditions, and $F(t)$ is a voltage that varies with time due to electronic drift and offset effects;
(b) GREF potential means for periodically, during a measurement interval, exposing said probe to a reference potential GREF at time t_0 such that when said probe is exposed to the ASV on the imaging medium at some later time t_1, a differential probe voltage $PV(t_1) - PV(t_0)$ is obtained and ASV can be determined according to the following relation:

$$ASV = \frac{PV(T_1) - PV(t_0)}{K_1(t)} + GREF$$

(c) a calibration target, disposed in at least a portion of said probe's sensing field at least during periodic calibration intervals, switchable between two predetermined potentials CTV_0 at time ct_0 and CTV_1 at time ct_1, said probe being responsive only to the potentials on said calibration target during the calibration interval such that a differential probe voltage $PV(ct_1) - PV(ct_0)$ is derived from the potentials on the calibration target according to the following relation:

$$CTV_1 - CTV_0 = \frac{PV(ct_1) - PV(ct_2)}{K_2(t)}$$

where $K_2(t)$ is a sensitivity factor associated with the calibration target which varies over time with changes in environmental and electrical conditions in a corresponding manner to the probe sensitivity $K_1(t)$;

(d) calibration means responsive to the differential probe voltage $PV(ct_1) - PV(ct_0)$ obtained during each calibration interval to provide an indication of the change in the sensitivity factor $K_2(t)$ for the calibration target, and to correspondingly recalibrate probe sensitivity $K_1(t)$ to compensate for variations in environmental and electrical conditions, thereby insuring accurate ASV measurements.

4,433,299

METHOD AND APPARATUS FOR MEASURING INTERFACIAL ELECTROKINETIC PHENOMENA

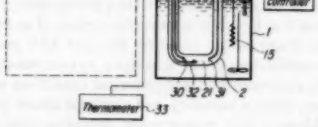
Yoshio Kawai, Musashino, and Kiyoshi Kitagawa, Komae, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Feb. 27, 1981, Ser. No. 238,822

Claims priority, application Japan, Mar. 7, 1980, 55-28915; Jan. 26, 1981, 56-9799

Int. Cl.³ G01N 27/62

U.S. Cl. 324—464 **9 Claims**



1. A method of observing electrophoretic phenomena of charged particles in a sample, comprising:

a first step of preheating the sample by supplying an alternating current to the sample at a frequency high enough to keep the charged particles in the sample substantially stationary; and

a second step of supplying a direct current to the sample thus preheated so as to observe the electrophoretic phenomena, and maintaining the electric power dissipation in the sample due to the direct current substantially equal to the electric power dissipation in the sample due to the alternating current.

4,433,300

FM DEMODULATOR INCLUDING AUTOMATIC THRESHOLD CONTROL CIRCUIT

Frank W. Ingle, 814 Richardson Ct., Palo Alto, Calif. 94303

Filed Jul. 27, 1981, Ser. No. 287,478

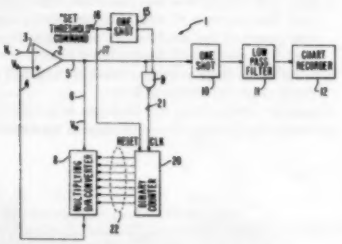
Int. Cl.³ H03D 3/00

U.S. Cl. 329—136 **19 Claims**

1. In an FM demodulating apparatus, having a threshold signal setting period and an operation period, an automatic threshold control circuit comprising:

means responsive to a threshold signal and an input signal due to noise on an input line during said threshold signal setting period for providing an output signal which changes polarity each time the difference between the amplitude of said threshold signal and said input noise signal changes polarity; and

means responsive to said input noise signal exceeding a predetermined magnitude within said threshold signal



setting period for controlling the magnitude of said threshold signal.

4,433,301

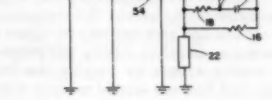
EQUALIZATION PREAMPLIFIER WITH HIGH FREQUENCY GAIN PEAKING

Henry J. Lukes, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Filed May 11, 1981, Ser. No. 262,372

Int. Cl.³ H03F 3/191

U.S. Cl. 330—109 **10 Claims**



1. An equalizing preamplifier circuit comprising:

an operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal;

a feedback circuit connected between said inverting input terminal and said output terminal including a first resistor and a second resistor wherein the resistance of said first resistor is greater than the resistance of said second resistor and a feedback capacitor connected in series between said second resistor and said operational amplifier output terminal;

an input filter including two low pass RC sections connected to said operational amplifier noninverting input;

and

means for connecting a capacitor of the second RC section from said noninverting terminal to the node of said feedback circuit between said feedback capacitor and said second resistor.

4,433,302

AMPLIFIER WITH INDEPENDENT QUIESCENT OUTPUT VOLTAGE CONTROL

Robert B. Davies, and Ira Miller, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,903

Int. Cl.³ H03F 3/45

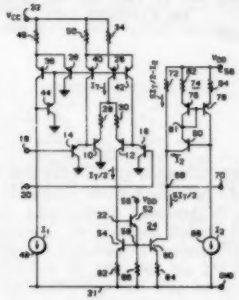
U.S. Cl. 330—257 **5 Claims**

1. An amplifier having an input terminal responsive to an input having rising and falling transitions, and an output terminal for providing a quiescent output voltage when said input is in one of said transitions, said circuit comprising:

current means coupled to said input terminal and responsive

to said input for establishing a predetermined current at a node;

load means coupled to said current means through said node and having a load current; and



mirror means coupled to both said load means and said current means at said node and having a mirror current, said predetermined current being substantially similar to the summation of said load current and said mirror current, said node coupled to said output terminal.

4,433,303

PUSH-PULL AMPLIFIER CIRCUIT WITH FIELD-EFFECT TRANSISTORS

Katshiro Sasaki, Tokyo, Japan, assignor to Pioneer Electronics Corporation, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,143

Claims priority, application Japan, Sep. 4, 1980, 55-126071

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—264 **5 Claims**

1. A push-pull amplifier circuit comprising:

first and second field-effect transistors opposite in electrical conductivity to each other, a common input signal being applied to the gates of said first and second field-effect transistors;

first and second impedance elements connected respectively between the source of said first field-effect transistor and a common reference potential point and between the source of said second field-effect transistor and said common reference potential point; and

current generating means, comprising first and second current mirror circuits receiving inputs from said first and second field-effect transistors, respectively, for outputting currents which have predetermined ratios with respect to currents in said first and second field-effect transistors, respectively, said currents thus outputted being applied to a common load.

4,433,304

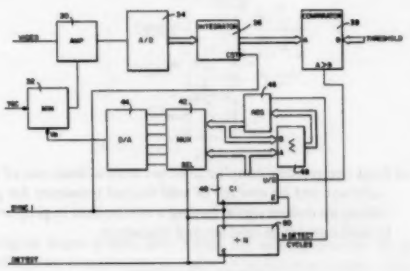
AUTOMATIC NOISE REJECTION FOR USE IN SCANNER AND THE LIKE

Gary L. Engle, Fair Oaks, Calif., assignor to General Electric Company, Rancho Cordova, Calif.

Filed Aug. 19, 1981, Ser. No. 294,159

Int. Cl.³ H03G *3/10*

U.S. Cl. 330—281 **7 Claims**



1. Circuitry for variably amplifying a signal in response to a time gain control signal and in which noise rejection is provided comprising

a variable gain amplifier including an input terminal for receiving an input signal, a control terminal for receiving a time gain control signal, and an output for an amplified signal,

first comparator means having first and second input terminals for receiving two signals for comparison and an output terminal for providing a comparison signal,

first means for receiving an amplified signal from said output of said variable gain amplifier and providing a first signal to said first terminal of said first comparator means,

second means for applying a threshold voltage to said second input of said comparator means,

counter means responsive to a comparison signal at said output terminal of said comparator means,

second comparator means having first and second input terminals for receiving two signals for comparison and an output terminal for receiving one of said two signals in response to the comparison,

third means for applying an established time gain control signal to said first input of said second comparator means,

fourth means for applying a signal derived from said counter means to said second input of said second comparator means, and

fifth means for applying a signal at said output terminal of said second comparator means to said control terminal of said variable gain amplifier.

4,433,305

AMPLIFIER CIRCUIT

Akio Ozawa; Susumu Sueyoshi; Keishi Sato; Kikuo Ishikawa; Kiyomi Yatsuhashi; Satoshi Ishii, and Masamichi Yumino, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,792

Claims priority, application Japan, Sep. 21, 1979, 54-121646; Sep. 21, 1979, 54-121649

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—296 **7 Claims**

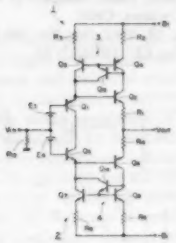
1. An amplifier circuit comprising:

a first transistor having a base to which an input signal is applied;

a second transistor of the conductivity type opposite that of said first transistor having a base coupled to an emitter of said first transistor;

means for supplying currents to said emitter of said first

transistor and a collector of said second transistor, the ratio of said currents being constant; and



at least one resistor coupled in series with at least one of said collector and an emitter of said second transistor for producing an output signal having a component in proportion to said current in said second transistor.

4,433,306

AUDIO-FREQUENCY POWER AMPLIFIER

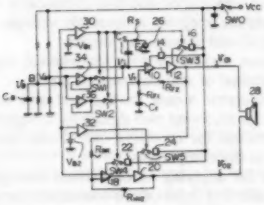
Hideo Honda, Yokohama; Chikara Tsuchiya, Tokyo; Yoshiaki Sano, Kawasaki; Toshio Hanazawa, Kawasaki, and Harumi Handa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 1, 1981, Ser. No. 279,457

Claims priority, application Japan, Jul. 4, 1980, 55-90537

Int. Cl.³ H03H *3/04*

U.S. Cl. 330—297 **8 Claims**



1. An audio-frequency power amplifier comprising:

a power switch through which a power supply voltage is provided when said power switch is closed;

first amplifying means for producing an output signal at an output port;

second amplifying means for producing an output signal at an output port, said output signal having a phase which is the inverse of the phase of the output signal from said first amplifying means;

a low impedance load directly connected between the output ports of said first and second amplifying means;

first operation control means, operatively connected to said power switch and said first amplifying means, for activating said first amplifying means after the closing of said power switch; and

second operation control means, operatively connected to said power switch and said second amplifying means, for maintaining the output port of said second amplifying means in a floating state for a first predetermined period of time after said first amplifying means is activated, and for activating said second amplifying means, after said first predetermined period of time, by providing the power supply voltage to said second amplifying means.

4,433,307

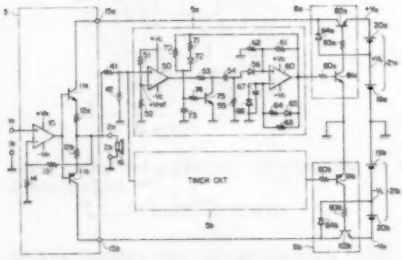
POWER SUPPLY CHANGEOVER TYPE POWER AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 16, 1981, Ser. No. 321,621

Int. Cl.³ H03F *3/20*

U.S. Cl. 330—297 **16 Claims**



1. A power supply changeover type power amplifier, comprising:

amplifying circuit means for amplifying an input signal;

timer means activated, upon receipt of an output signal delivered from said amplifying circuit means, only for a predetermined first length of time whenever said output signal exceeds a predetermined level, and inhibited of its re-activation for a predetermined second length of time following the lapse of said predetermined first length of time;

power supply means provided with a high voltage power supply and a low voltage power supply to be selectively supplied to said amplifying circuit means; and

changeover means for changing over the connection of said high voltage power supply and said low voltage power supply of said power supply means to said amplifying circuit means upon receipt of an output signal delivered from said timer means.

4,433,308

PLL DETECTION CIRCUIT

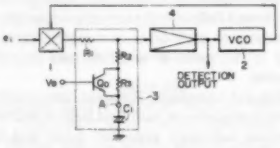
Hitoshi Hirata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 326,994

Claims priority, application Japan, Dec. 8, 1980, 55-176020[U]

Int. Cl.³ H03L *7/08*

U.S. Cl. 331—17 **4 Claims**



1. A phase lock loop detection circuit of the type comprising a loop filter having a time constant determined by a plurality of elements, means for detecting when an output of said loop filter is in a predetermined level range and providing a detection signal, and a switch circuit for changing a time constant of said loop filter in response to said detection signal, the improvement characterized in that said switch circuit comprises:

first and second diodes having cathodes which are con-

nected respectively to both ends of at least one of said elements and anodes which are connected together;

third and fourth diodes having anodes which are connected respectively to said both ends of said one element, and cathodes connected together; and

activating means for activating said first, second, third and fourth diodes in response to said detection signal.

4,433,309

PROXIMITY SWITCH WITH BUILT-IN TEST CIRCUIT

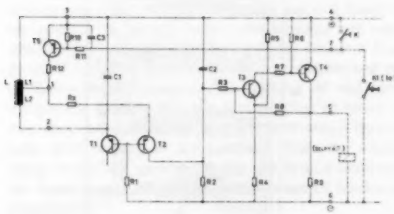
Rolf Hernle, Nürtingen; Heinz Kammerer, Ostfildern-Nellingen, and Hans Langheinrich, Leonberg, all of Fed. Rep. of Germany, assignors to Gebhard Balluff Fabrik Feinmechanischer, Fildern, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,200

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007929; Aug. 2, 1980, 3029489

Int. Cl.³ G08B *13/26*

U.S. Cl. 331—65 **15 Claims**



1. Proximity switch for the monitoring of movable elements comprising an oscillator having an oscillatory circuit with an inductive control element variable in its impedance due to approaching elements and an electric monitoring means for monitoring the correct functioning of the proximity switch, characterized in that the monitoring means has an electrically switchable damping circuit (V, K; T5, R10–R12, K1; T6, R13, Rx, K2) for testing purposes, the oscillator (L, C1, R1, R2, T1, T2) being dampable with the aid of said damping circuit.

4,433,310

MODULATOR-DEMODULATOR FOR FOUR LEVEL DOUBLE AMPLITUDE MODULATION ON QUADRATURE CARRIERS

Jean-Claude Bic, 10 bis rue des 3 Yvonne, F-94100 St Maur; Pierre C. Brossard, 9, rue des Fleurs, F-78190 Montigny-le-Bretonneux, and Daniel Duponteil, 45, rue Anatole France, F-92370 Chaville, all of France

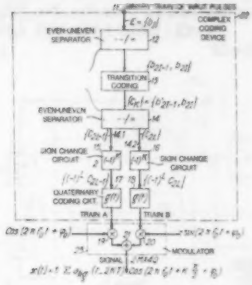
Filed Dec. 22, 1980, Ser. No. 219,318

Claims priority, application France, Dec. 31, 1979, 79 32166

Int. Cl.³ H03C *1/00*; H03D *1/00*

U.S. Cl. 332—9 R **5 Claims**

1. A modulator operating with a double amplitude four-level modulation in phase quadrature on two carrier components, each of said two carrier components having a cyclic recurrence of bit time periods which define a basic time cycle, said two carrier components having a predetermined phase relationship with each other, said modulator comprising means for shifting the phases of two binary trains of digital input pulses in order to encode the two binary trains by one/half of a bit time period in the basic time cycle, means for modulating said respective carrier components responsive to said encoded trains



of digital input pulses, and means for adding the two modulated carrier components in order to produce an output signal.

4,433,311

DELTA MODULATION SYSTEM HAVING REDUCED QUANTIZATION NOISE

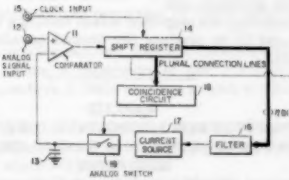
Toyota Noguchi, Kyoto; Mamoru Kaneko, Neyagawa, and Hironori Kstoh, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 17, 1981, Ser. No. 244,646

Claims priority, application Japan, Mar. 19, 1980, 55-35316

Int. Cl.³ H03K *13/22*

U.S. Cl. 332—11 D **3 Claims**



1. A delta modulation system comprising:

an analog comparator for comparing an input analog signal with an output signal of an integrator;

a shift register connected to an output of said analog comparator for storing an output signal of said comparator, said shift register being shifted by a clock pulse signal having a predetermined clock pulse period;

a syllabic filter means connected to an output of said shift register for determining a step size of an integration of said integrator in accordance with a parallel output signal of said shift register, said integrator integrating an output signal of said syllabic filter means;

an integration stoppage circuit disposed between said syllabic filter means and said integrator for stopping said integration of said integrator; and

a pattern recognition circuit connected to said integration stoppage circuit for controlling said integration stoppage circuit in accordance with at least a part of said parallel output signal of said shift register;

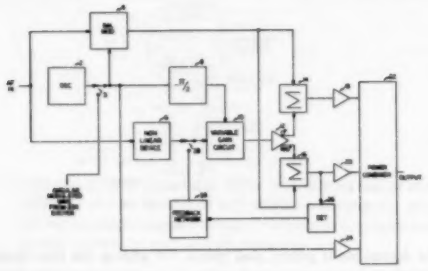
wherein said pattern recognition circuit enables said integration stoppage circuit to stop said integration when said output signal of said comparator changes its signal level after at least two consecutive clock pulse periods of outputting an unchanged output signal.

4,433,312

METHOD AND MEANS FOR MODULATING WAVES

Leonard R. Kahn, 137 E. 36 St. (Apt. 6A), New York, N.Y. 10016

Filed Dec. 18, 1981, Ser. No. 332,018
Int. Cl.³ H03C 1/50, 1/52, 5/00
U.S. Cl. 332—22 16 Claims



1. The method of producing an envelope modulated wave by use of three signal amplifiers comprising the following steps:

(a) generating an unmodulated carrier wave,

(b) amplifying said unmodulated carrier wave in a first signal amplifier,

(c) phase modulating a portion of the carrier wave generated in step (a) with an input signal to produce a first phase modulated wave,

(d) amplifying said first phase modulated wave in a second signal amplifier,

(e) phase modulating another portion of the carrier wave generated in step (a) with the input signal to produce a second phase modulated wave,

(f) amplifying said second phase modulated wave in a third signal amplifier, and,

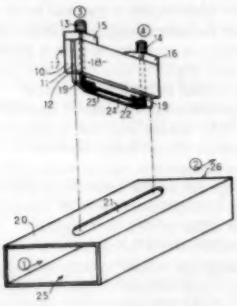
(g) combining the amplified waves resulting from steps (b), (d) and (f) to produce the desired envelope modulated wave.

4,433,313

APPARATUS FOR MICROWAVE DIRECTIONAL COUPLING BETWEEN A WAVEGUIDE AND A STRIPLINE

Jacques Saint, Houilles, and Gerard Collignon, Savigny sur Orge, both of France, assignors to Societe d'Etude du Radant, France

Filed Sep. 9, 1981, Ser. No. 300,603
Claims priority, application France, Sep. 12, 1980, 80 19693
Int. Cl.³ H01P 5/18, 5/107
U.S. Cl. 333—109 15 Claims



1. A directional microwave coupler to couple microwave energy from a waveguide transmission line to a stripline transmission line comprising:

(a) a longitudinal slot fashioned in a side of said waveguide;

(b) a central conductor of said stripline extending through said slot and into said waveguide; and

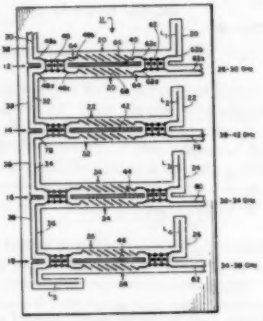
(c) phase-shifting means including at least one capacitor mounted in series with said central conductor for equalizing the phase velocity of the microwaves in said conductor and the phase velocity of the microwaves in said waveguide adjacent to said conductor.

4,433,314

MILLIMETER WAVE SUSPENDED SUBSTRATE MULTIPLEXER

Alfred R. Hislop, and David Rubin, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1982, Ser. No. 341,357
Int. Cl.³ H01P 1/213
U.S. Cl. 333—110 13 Claims



1. A multiplexer for separating the components of a signal having signal components in N bands of frequencies comprising:

a dielectric substrate;

first means disposed on said substrate for receiving a signal including signal components within at least one of N bands of frequencies;

N suspended substrate channel dropping filters disposed on said dielectric substrate each having an input port, a signal pass output port and a signal reject output port, a first one of said N channel dropping filters having its input port operably coupled to said first means and each of the remaining N−1 channel dropping filters having its input port operably coupled to the signal reject output port of one of the other N−1 channel dropping filters;

a metallic housing forming a cavity surrounding said dielectric substrate, said first means and said N channel dropping filters;

each of said N channel dropping filters comprising:

a first hybrid coupler;

a bandpass filter operably coupled to said first hybrid coupler;

a second hybrid coupler operably coupled to said bandpass filter;

each of said bandpass filters comprising first and second substantially identical edge-coupled filters;

said metallic housing having a top portion and a bottom portion; and

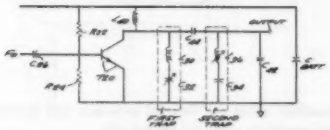
each pair of said first and second substantially identical edge-coupled filters having a metallic wall positioned between first and second edge-coupled filters and extending between said metallic housing top and bottom portions.

4,433,315

TUNABLE COUPLING NETWORK

Johannes J. Vandegraaf, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 24, 1981, Ser. No. 324,665
Int. Cl.³ H03H 7/01; H03B 5/08
U.S. Cl. 333—174 6 Claims



1. A multiplier for generating a signal at a desired harmonic of a fundamental frequency excitation comprising:

a non-linear amplifier stage for providing, in response to said fundamental frequency excitation signal, an output including frequency components at said fundamental frequency and at harmonics thereof; and

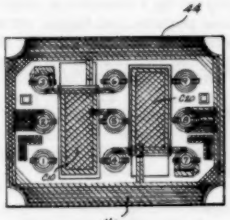
a tuned circuit having rejection notches above and below a passband frequency range including the desired harmonic of the fundamental frequency said tuned circuit including at least one tunable value component and one fixed value component, the circuit values of said fixed and tunable components being selected such that the circuit is tunable to select a desired harmonic over a predetermined range of fundamental frequencies, the tuning of said tunable component causing the rejection notches to move such that they are maintained at a predetermined frequency ratio with respect to the passband when the circuit is tuned so that the passband tracks the desired harmonic of the fundamental frequency over a range of fundamental frequencies.

4,433,316

CRYSTAL FILTER AND METHOD FOR FABRICATION

Gerald E. Roberts, Lynchburg, and Alfred G. Staples, Evergreen, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Aug. 28, 1981, Ser. No. 297,498
Int. Cl.³ H03H 9/205, 9/60
U.S. Cl. 333—189 10 Claims



6. A crystal filter, comprising:

a ceramic substrate;

a thick film circuit formed on said ceramic substrate including at least one capacitor, said thick film circuit comprising a lower electrode formed on the substrate, a dielectric layer formed on the lower electrode and an upper electrode formed on the dielectric layer; and

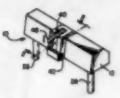
two coupled-dual resonator crystals mechanically coupled to the substrate and electrically coupled with the thick film circuit to form the crystal filter.

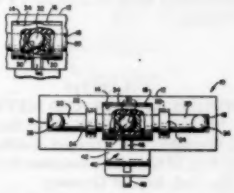
4,433,317

CONTROLLED FLOATING CONTACTOR SWITCH

Robert H. Twyford, Great Falls, Va., assignor to Mechanical Enterprises, Inc., Herndon, Va.

Continuation-in-part of Ser. No. 340,366, Jan. 18, 1982, abandoned. This application Dec. 16, 1982, Ser. No. 450,227
Int. Cl.³ H01H 1/66, 51/00
U.S. Cl. 335—151 13 Claims





1. A switch comprising:

a housing having a cavity therein;

a pair of contact members mounted in said cavity with the ends thereof spaced to provide opposed contact surfaces, each said contact surface being defined within an area bounded by the periphery of the contact member end, and portions of said surfaces being spaced a predetermined distance with said distance being less than the spacial distance between the remainder of the areas of said surfaces;

a floating contactor member disposed between said contact surfaces having a dimension in the direction of said contact members at least as great as said predetermined distance;

a resilient sleeve enclosing said contact surfaces and the space therebetween so as to encircle and resiliently support said contactor member; and

actuator means associated with said housing to apply force through said sleeve on said contactor member to displace said contactor member and said resilient sleeve to effect closing of said switch by interengagement between said members.

4,433,318

DEFLECTION YOKE FOR A PICTURE TUBE OF A PROJECTION COLOR TELEVISION RECEIVER SET

Nobutaka Okuyama; Toshiharu Shimizu, and Yoshikazu Naito, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 391,983
Claims priority, application Japan, Jun. 26, 1981, 56-98221; Oct. 26, 1981, 56-170018
Int. Cl.³ H01F 5/00
U.S. Cl. 335—213 10 Claims

1. A deflection yoke for a picture tube of a projection color television receiver set, comprising:

(1) a generally horn-shaped core;

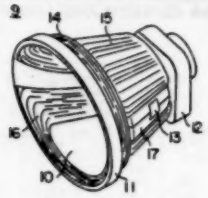
(2) a vertical deflection winding toroidally wound on said core;

(3) a saddle-shaped horizontal deflection winding arranged in said core;

(4) a generally horn-shaped separator arranged between said

vertical deflection winding and said horizontal deflection winding; and

(5) a solenoid-shaped auxiliary coil having a center axis thereof substantially aligned to a center axis of said core



and arranged adjacent to said vertical deflection winding, said auxiliary coil being electrically connected to said vertical deflection winding to receive a vertical deflection current thereto.

4,433,319

MOISTURE SENSOR AND METHOD OF MANUFACTURING THE SAME

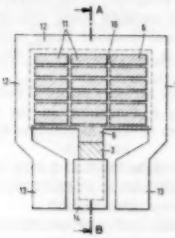
Ernst Lüder, Stuttgart, and Traugott Kallfass, Grossbottwar, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 272,065

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024297

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **36 Claims**



1. A moisture sensor comprising a thin layer of tantalum oxide applied to a moisture insensitive substrate and at least two electrodes placed on the tantalum oxide layer spaced apart from each other wherein the tantalum oxide layer comprises the oxide of highly resistive low density tantalum where the tantalum in the layer applied to the substrate has a density of less than 15 g/cm^3, and preferably less than 14 g/cm^3.

4,433,320

DEW SENSOR

Michihiro Murata, Kyoto, and Akira Kumada, Ootsu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 18, 1982, Ser. No. 409,028

Int. Cl.³ H01L *7/00*

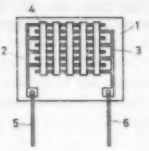
U.S. Cl. 338—35 **6 Claims**

1. A dew sensor, comprising:

a substrate,

a pair of opposing detecting electrodes formed on said substrate, and

a plurality of humidity sensitive members formed on said substrate, said plurality of humidity sensitive members being spaced apart and each connecting said opposing detecting electrodes such that a plurality of exposed



boundary areas are formed between said humidity sensitive members and said electrodes.

4,433,321

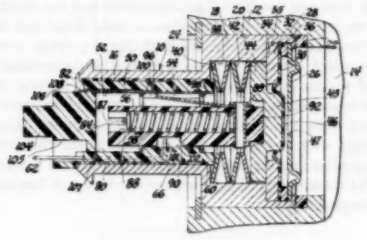
PRESSURE TRANSDUCER

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 15, 1982, Ser. No. 418,201

Int. Cl.³ H01L *10/10*

U.S. Cl. 338—42 **3 Claims**



1. In a pressure transducer adapted for communication with a pressure system producing a variable pressure signal wherein the transducer has a potentiometer including a resistor connectable with a supply conductor and a ground conductor and a relatively movable conductive wiper connectable with a control conductor and a pressure sensor responsive to the variable pressure signal to move the wiper along the resistor so as to convert the variable pressure signal into a variable voltage signal: the improvement comprising the resistor being in the form of a strip having a resistance portion located intermediate two terminal portions, and resistor mounting means for mounting the strip in the transducer so that the terminal portions remain in conductive relationship in the potentiometer for connection with the supply conductor and ground conductor while the strip is slidably adjustable external of the transducer to adjust the resistance portion relative to the wiper to thereby enable ready calibration of the voltage signal with respect to the pressure signal without entering the transducer.

4,433,322

VARIABLE RESISTOR

Masaru Hirayama; Nobuaki Anzai, and Ryusuke Shirouzu, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,974

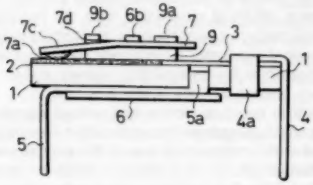
Claims priority, application Japan, Feb. 18, 1981, 56-20728[U]; Mar. 23, 1981, 56-39046[U]

Int. Cl.³ H01C *10/32*

U.S. Cl. 338—162 **6 Claims**

1. In a variable resistor including an insulating substrate carring a resistance layer, a slider mounted for rotation relative said insulating substrate and having a contact portion adapted to be turned in sliding contact with said resistance layer, and an

insulating spacer separating said slider from said insulating substrate; the improvement wherein said slider is provided with a plurality of holes extending therethrough, and said insulating spacer is formed from a synthetic resin molded into



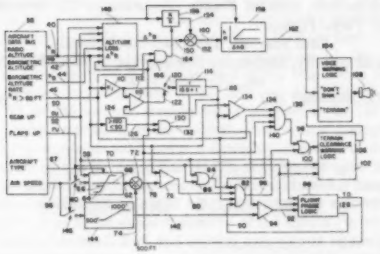
its shape directly onto a surface of said slider with portions of said synthetic resin extending through said holes to secure said spacer and said slider integrally together to form a unitary component.

4,433,323

GROUND PROXIMITY WARNING SYSTEM WITH TIME AND ALTITUDE BASED MODE SWITCHING

Michael M. Grove, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Feb. 4, 1982, Ser. No. 345,891
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—970 **32 Claims**



1. A ground proximity warning system for aircraft comprising:

a source of signals representing aircraft flight parameters;

a source of a signal representing aircraft radio altitude;

means responsive to said radio altitude signal for generating a time based altitude signal that increases as a function of increasing radio altitude and time;

a first warning mode means responsive to said flight parameter signals and said radio altitude signal for generating a warning signal in accordance with a first predetermined relationship between flight parameters;

a second warning mode means responsive to said flight parameter signals and said radio altitude signal for generating said warning signal in accordance with a second predetermined relationship between flight parameters; and

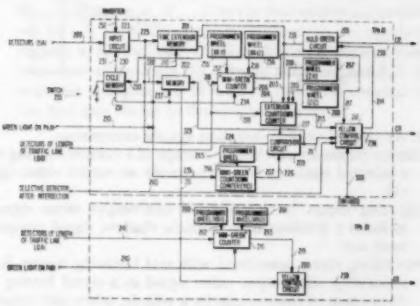
means operatively connected to said first and said second warning mode means and responsive to said time based altitude signal for deactivating said first warning mode means.

4,433,324

DEVICE TO PROMOTE THE MOVEMENT OF BUSES BY ALLOCATION OF PRIORITY OF CROSSING OF AN INTERSECTION CONTROLLED BY TRAFFIC LIGHTS

Francis Guillot, "Les Hauts de Cimiez", 44, avenue de la Marne, 06100 Nice, France

Continuation-in-part of Ser. No. 765,009, Feb. 2, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,920
Claims priority, application France, Mar. 21, 1975, 75 10336
Int. Cl.³ G08G *1/095, 1/07, 1/08*
U.S. Cl. 340—923 **5 Claims**



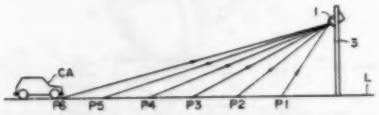
1. Device to promote movement of buses by allowing them priority of passage through intersections which are controlled by lights, with said priority modified by the movement of the other vehicular traffic, said device comprising a controller CR of the lights of the intersection; a unit T Ph A for each of the streets Ph A on which the buses travel, each T Ph A unit having means to receive from said controller information on the state of the green light on street Ph A, and means to receive, from bus detectors DS A1, information that a bus traveling on said street Ph A is approaching the intersection, and means to receive, from detectors of the state of the traffic movement LQ B1, information as to whether traffic adjacent the intersection on a cross street Ph B is moving or non-moving; said unit having two programmer wheels 255 and 256 for selectively setting two minimum time durations X A 11 and X A 12 of the green lights of said street Ph A, one corresponding to the "moving traffic" information and the other corresponding to the "non-moving traffic" information received from said traffic movement detectors, and two programmer wheels 267 and 268 for selectively setting two time durations of time extensions Z 11 and Z 12 for extension of the green light of said street Ph A, one corresponding to said "moving traffic" information and the other corresponding to said "non-moving traffic" information, and a programmer wheel 265 for selectively setting a time duration Y 10 which is the maximum permitted duration of the green light of said street Ph A; the unit T Ph A having means to act on controller CR of the lights of the intersection to speed the passage of buses detected by DS A1 on PH A without unduly delaying traffic detected by LQ B1 on Ph B; and a unit T Ph B for each of the streets Ph B on which no bus travels, the T Ph B unit having means to receive from controller CR, information on the state of the green light of said street Ph B, and from detectors of the state of the traffic LQ A1, information as to whether the traffic adjacent the intersection on the same street Ph A as the bus is moving or non-moving, the T Ph B unit comprising two programmer wheels 260 and 261 for selectively setting two minimum time durations X B 11 and X B 12 of the green light of said street Ph B, the T Ph B unit having means to act on controller CR of the intersection lights to promote the flow of the traffic in which the bus would otherwise be delayed.

4,433,325

OPTICAL VEHICLE DETECTION SYSTEM

Ryohei Tanaka, Osaka; Akinobu Kitamura; Takaaki Odake, both of Nagaokakyo, and Yutaka Kato, Kyoto, all of Japan, assignors to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed Sep. 29, 1981, Ser. No. 306,775
Claims priority, application Japan, Sep. 30, 1980, 55-137391; Oct. 6, 1980, 55-140105
Int. Cl.³ G08G 1/00, 1/04
U.S. Cl. 340—937 6 Claims



1. An optical vehicle detection system comprising:

camera means for catching the image of a vehicle running in a selected roadway lane to generate an output video signal,

inquiring means for inquiring if said output video signal includes a predetermined vehicle shadow signal component, and

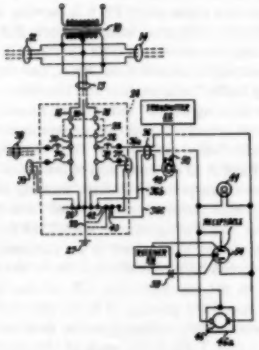
processing means associated with said inquiring means, for processing said output video signal as a signal having a component of shadow cast by a vehicle, when said output video signal includes the predetermined shadow signal component.

4,433,326

POWER LINE COMMUNICATION SYSTEM USING THE NEUTRAL AND GROUND CONDUCTORS OF A RESIDENTIAL BRANCH CIRCUIT

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,631
Int. Cl.³ H04M 11/04
U.S. Cl. 340—310 A 13 Claims



1. A power line communication system for signalling over a low voltage AC power distribution system for distributing electrical power at an AC power frequency throughout a building, wherein the power distribution system includes a load center and a plurality of branch circuits, the load center having at least one main busbar to which a main of a service entry feed is connected and a neutral bus to which a neutral cable of the service entry feed is connected, the neutral bus being solidly clamped to ground potential, each branch circuit having a line conductor electrically connected with the main busbar and a neutral conductor terminated in electrical connection with the neutral bus, said communication system comprising, in combination:

A. a signal communication link consisting of at least one of the branch circuits, said one branch circuit including, in addition to a line conductor and a neutral conductor, a ground conductor terminated within the load center in common electrical connection with the neutral bus and neutral conductor and otherwise electrically isolated from the neutral conductor downstream from the load center;

B. a transmitter for transmitting voltage signals of a frequency greater than the power frequency;

C. a receiver tuned to receive said voltage signals;

D. a signal coupling transformer having a core magnetically linked with a segment of one of the neutral and ground conductors of said one branch circuit to provide one winding thereof and a second winding wound on said core connected with one of said transmitter or said receiver, whereby an impedance is created in said segment across which said voltage signals are developed; and

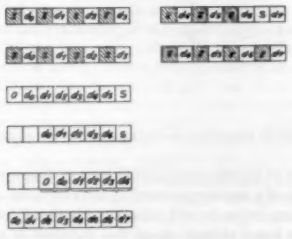
E. capacitive coupling means connecting the other of said transmitter or said receiver across the neutral and ground conductors of said one branch circuit at a location downstream from said transformer, said coupling means exhibiting a high impedance at the power frequency, whereby voltage signals appearing on one of the ground and neutral conductors with respect to the other propagate along said one branch circuit between said transmitter and receiver, said voltage signals being precluded from propagating onto the neutral cable of the service entry feed by virtue of the neutral bus being clamped to ground potential at the voltage signal frequency.

4,433,327

APPARATUS FOR CONVERTING NUMERAL REPRESENTING DATA CODING FORMATS RECEIVED OR DERIVED BY A CENTRAL PROCESSING UNIT

Philippe M. A. Vallet, Lardy, and Annie M. M. Vinot nee Ricol, Sucy-en-Brie, both of France, assignors to CII Honeywell Bull, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,410
Claims priority, application France, Apr. 1, 1980, 80 07287
Int. Cl.³ G06F 3/00
U.S. Cl. 340—347 DD 9 Claims



1. Apparatus for converting numeric representing characters derived by a data processing system externally of a data processor unit into numeric characters processed internally in the unit, the external characters being coded in any of: (a) first and second successive multi-bit words, each including a like number (N) of multiplets, each including a like number (M) of bits, where N and M are integers greater than two, alternate multiplets of the first and second words representing numeric values having different significant bit positions, the remaining multiplets of the first word and all but one of the remaining multiplets of the second word representing numerical values in a given table representing numeric characters in a particular data coding format, the one remaining multiplet of the second word representing a sign allocated to the numeric value of the alter-

nate multiplets of the first and second words, (b) third and fourth successive multi-bit words, each including a like number (N) of multiplets, each including a like number (M) of bits, wherein alternate multiplets of the third and fourth words represent numeric values having different significant bit positions, the remaining multiplets of the first and second words and all but one of the remaining multiplets of the second word representing numerical values in a given table representing numeric characters in a particular data coding format, (c) fifth multi-bit words, each including N multiplets each including M bits, (N-2) multiplets of the fifth words representing numeric values having different significant bit positions, a first remaining multiplet of the fifth words representing the sign of the fifth words, the second remaining multiplet of the fifth words completing the fifth words, (d) sixth multi-bit words, each including R multiplets each including M bits, where R is less than N, one multiplet of the sixth words representing the sign of the sixth words having the same position as the first remaining multiplet of the fifth words, the remaining multiplets of the sixth words representing numeric values having different signficant bit positions; the internal characters being coded in multi-bit words each including N multiplets each including M-bits, each multiplet of the internal code representing a numeric character having a different significant bit position, the converting apparatus comprising: first buffer register means internal of the data processor unit responsive to the externally derived characters, the first buffer register means including first and second sections, each section including N segments, each segment storing M bits, the first section being responsive to the first, third, fifth and sixth words, the second section being responsive to the second and fourth words segments A, B . . . D of the first section being responsive to the alternate multiplets of the first and third words, segments E, F . . . H of the second section being responsive to the alternate multiplets of the second and fourth words, segments I, J . . . L of the first section being responsive to the remaining multiplets of the first and third words, segments B . . . D, I, J . . . L of the first section being responsive to the (N-2) multiplets of the fifth words and the R multiplets of the sixth word, segment A of the first section being responsive to the second remaining multiplet of the fifth words, (R-1) of segments A, B . . . D of the first section being responsive to the remaining multiplets of the sixth words, segment P of the first section being responsive to the sign representing multiplets of the fifth and sixth words, segment Q of the second section being responsive to the sign representing multiplet of the second word, a first multiplexer having N segments with input terminals connected to output terminals of the N segments of the first and second buffer register sections, each segment of the first multiplexer handling M bits simultaneously, an M bit error checking network responsive to an M bit signal indicative of the sign of the character being converted, first and second gate means respectively connected between output terminals of segments P and Q and input terminals of the checking network for selectively coupling the M bits of segments P and Q to M input terminals of the checking network, an operation register of the processor having M×N input terminals connected to M×N output terminals of the N segments of the multiplexer, the processor unit including a control source for controlling connections between output terminals of the first buffer register means and the M×N input terminals of the operation register via the N segments of the first multiplexer and segments P and Q of the checking network via the first and second gate means so that when:

(a) the first and second words are simultaneously converted (1) the alternate multiplets in segments, A, B . . . D of the first section and in segments E, F . . . H of the second section are simultaneously coupled via the multiplexer to the operation register to the exclusion of the multiplets in the remaining segments of the first and second sections and (2) the sign representing multiplet in segment Q of the second section is coupled via the second gate means to the checking network,

(b) the third and fourth words are simultaneously converted the alternate multiplets in segments A, B . . . D of the first section and in segments E, F . . . H of the second section are simultaneously coupled via the multiplexer to the operation register to the exclusion of the multiplets in the remaining segments of the first and second sections;

(c) the fifth words are converted (1) the multiplets in segments A, B . . . D, I, J . . . L in the first section are simultaneously coupled via the N segments of the multiplexer to the operation register to the exclusion of the multiplets in the remaining segments of the first and second sections and (2) the multiplet in segment P of the first section is coupled via the first gate means to the checking network;

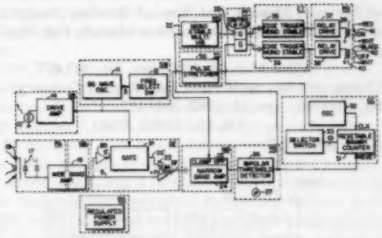
(d) the sixth words are converted (1) the multiplets in the (R−1) segments A, B . . . D of the first section are coupled via (R−1) segments of the multiplexer to the operation register to the exclusion of the multiplets in the remaining segments of the first and second sections, and (2) the multiplet in segment P of the first section is coupled via the first gate means to the checking network.

4,433,328

MOTION SENSING ENERGY CONTROLLER

Marc E. Saphir, 4 Commodore Dr., Suite 441, Emeryville, Calif. 94608, and Michael A. Reed, 3086 W. Avenida Cresta, Tucson, Ariz. 85705

Filed Jan. 16, 1980, Ser. No. 112,387
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—555 **46 Claims**



1. A method for detecting the presence or absence of relatively low frequency motions of objects in a zone of interest, said method comprising the steps of:

propagating high frequency modulated radiation lying in a predetermined portion of the spectrum into said zone of interest;

detecting said radiation reflected from objects in said zone, said detecting including the step of generating electrical signals representative of the detected radiation;

processing the detected radiation to determine the presence of relatively low frequency variations therein, said processing including the step of normalizing said electrical signals to remove variations caused by changes in the level of background radiation present in said zone, said normalizing including the steps of generating inverted amplified signals from the original electrical signals, partial cycle gating of said inverted amplified signals, and summing the partial cycle gated signals with the original electric signals; and

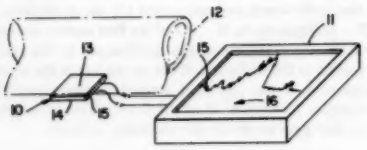
generating a control signal when said low frequency variations are present.

4,433,329

ULTRASENSITIVE APPARATUS AND METHOD FOR DETECTING CHANGE IN FLUID FLOW DURING THE OCCURRENCE OF A TRANSIENT CONDITION

Stephen F. Streib, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 5, 1980, Ser. No. 184,559
Int. Cl.³ G08B *21/00*; G01K *17/00*
U.S. Cl. 340—636 **11 Claims**



1. Method of providing detection of change of fluid flow within a fluid-carrying body from a location completely exterior thereof, while maintaining the integrity of the interior of the body intact comprising:

(a) positioning a heat flux sensing transducer-meter exterior of but in heat conducting contact with the exterior of said body;

(b) monitoring change in fluid flow interior of said body by generating a transient cascaded output signal proportional to transient variation in heat flux detected exterior of said body at said transducer-meter;

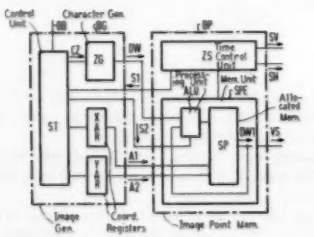
(c) indicating at least said transient cascaded output signal as a function of time.

4,433,330

APPARATUS FOR DISPLAYING CHARACTERS ON A PICTURE SCREEN OF A DISPLAY UNIT

Ivan Furjanic, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,077
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013706; Apr. 15, 1980, 3014437
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—750 **11 Claims**



1. An apparatus for displaying characters on a picture screen of a display unit line by line comprising:

an image generator including a character generator for generating data words corresponding to the shapes of the characters to be displayed;

an image repetition memory interconnected between said image generator and said display unit and a means for periodically reading out the contents of said image repetition memory;

an allocated memory connected to said image repetition memory having one memory element allocated to each raster point on said picture screen, said data words being stored in said memory elements at random addresses for display on said picture screen in any desired pattern; and

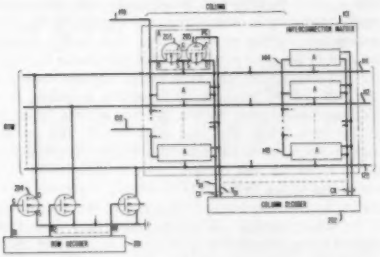
a processing unit having a logic linkage interconnected between said allocated memory and said image generator for combining data words read out of said memory elements in said allocated memory with data words from said image generator and for entering a combined data word formed therefrom by said processing unit in said allocated memory for storage therein.

4,433,331

PROGRAMMABLE LOGIC ARRAY INTERCONNECTION MATRIX

Paul W. Kollaritsch, Hazlet, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 14, 1981, Ser. No. 330,222
Int. Cl.³ H04Q *9/00*; H03K *19/20*
U.S. Cl. 340—825.83 **16 Claims**



1. An electrical interconnection matrix comprising a plurality of substantially orthogonally disposed and electrically isolated rows and columns of electrical conductors including programmable cross points at intersections between the row and column conductors for enabling electrical connection therebetween

characterized in that

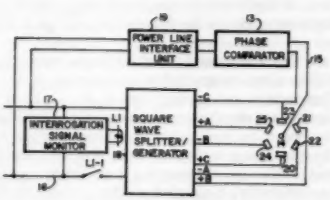
said column conductors are arranged in groups, each of said column conductors comprising two or more electrically isolated colinear segments, the segments of different groups having programmable cross points to a unique group of row conductors.

4,433,332

APPARATUS FOR REMOTELY DETERMINING THE POSITION OF ROTATING OBJECTS

Thomas D. Wason, Raleigh, N.C., assignor to Cain Encoder Co., Greenville, N.C.

Filed Nov. 24, 1980, Ser. No. 209,878
Int. Cl.³ G08C *19/10*
U.S. Cl. 340—870.37 **2 Claims**



1. An improved apparatus for remotely monitoring the angular position, speed, and/or direction of rotation of a member as

it rotates about an axis of rotation and defines a circumferential path comprising:

(a) means for generating an electric field in which the resultant vector representing maximum field strength rotates in a path parallel to said circumferential path of the rotating member and includes said circumferential path therein;

(b) a reading electrode means fixedly positioned within said electric field and symmetrically placed with respect to said axis of rotation for sensing a voltage change responsive to the crossing of said rotating member by said resultant vector and emitting an output signal responsive to said voltage change; and

(c) said means for generating the electric field and said reading electrode both being positioned in confronting, spaced relation to, but in no way otherwise mechanically or electrically connected to said rotating member other than that a portion of said rotating member is within the path of said rotating electric field;

(d) said means for generating a rotating electric field comprising:

(i) means for generating a polyphase voltage having a plurality of signals, each separated from the other by a prescribed phase angle, and each signal shaped as a square wave;

(ii) a plate positioned in spaced, confronting, parallel relation to said circumferential path;

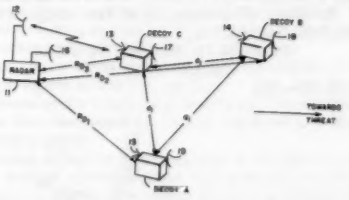
(iii) a plurality of exciting electrodes defining a circular array around a center point aligned with said axis of rotation of said rotating member, successive electrodes being connected to successive signals of said polyphase voltage.

4,433,333

TRANSMITTER PEAK POWER EFFICIENT PSEUDO-BLINK ARM DECOY SYSTEM

David V. Manoogian, Lynnfield; Bernard H. Labitt, Needham, and Joseph R. Wood, Lawrence, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,282
Int. Cl.³ G01S 7/36
U.S. Cl. 343—18 E **4 Claims**



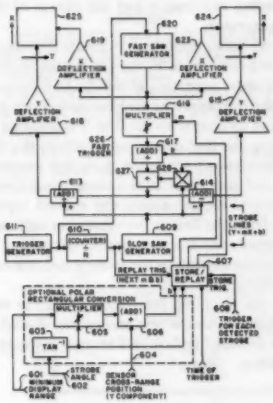
1. A method for simulating false locations of a radar transmitter comprising the steps of locating a plurality of decoy transmitters spaciously from each other and said radar transmitter; providing said decoy transmitters with segmented antennas so that each antenna will cover a different portion of a predetermined required azimuth and elevation coverage area when using a selected portion of its antenna; switching means associated with said decoy transmitters so as to sequentially switch antenna segments which are transmitted on said decoy transmitter transmitters so that each decoy sequentially covers a different portion of said required coverage area in a cyclical manner; and selecting said antennas segments of the decoy transmitters such that the entire required azimuth and elevation coverage area is radiated by the decoy transmitters at all times.

4,433,334

PASSIVE RANGING SYSTEM

William J. Caputi, Jr., Centerport, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 21, 1982, Ser. No. 423,427
Int. Cl.³ G01S 3/02
U.S. Cl. 343—450 **3 Claims**



1. Apparatus for determining the location and velocity of a target from the angle of strobes emitted by the target, the time of the strobes, and the cross-range position of the sensor at the time of each strobe, comprising:

(a) a first cathode-ray tube,

(b) a second cathode-ray tube,

(c) a first Y deflection amplifier connected to the first cathode-ray tube to control the Y deflection of the first tube,

(d) a second Y deflection amplifier connected to the second cathode-ray tube to control the Y deflection of second tube,

(e) a first X deflection amplifier connected to the first cathode-ray tube to control the X deflection of the first tube,

(f) a second X deflection amplifier connected to the second tube to control the X deflection of the second tube,

(g) a store-replay unit means for accepting the following four input: a trigger to store each strobe, the arc tangent of the strobe angle, and a function equal to a minimum display range desired multiplied by the arc tangent of the strobe angle, all added to the sensor cross range position, and the time of the strobe said store replay unit means storing and processing such inputs as delineated in paragraph (1),

(h) a trigger generator,

(i) a fast saw-tooth generator, receiving as an input the trigger from the trigger generator to initiate each saw-tooth pulse, the output saw-tooth being supplied to the X deflection amplifiers to provide a sweep of the cathode-ray tubes,

(j) a divide-by-N-counter receiving as an input the trigger from the trigger generator to produce a lower frequency trigger output at a frequency equal to the trigger generator frequency divided by N, the lower frequency trigger output being in synchronism with the trigger from the trigger generator,

(k) a slow saw-tooth generator receiving the slow trigger output of the divide-by-N-counter to initiate each saw-tooth wave,

(l) means for coupling the slow trigger output from the divide-by-N-counter to the store replay unit means to cause the store replay unit means to provide the following outputs: a time of strobe, the slope of the strobe line (m) and the intercept of the strobe line (b), derived from the

minimum display range, the cross range position and the arc tangent of the strobe angle as delineated in paragraph (g),

(m) a first multiplier receiving as inputs the output of the fast saw-tooth generator and the slope (m),

(n) a first adder receiving as inputs the output of the first multiplier and the strobe intercept (b),

(o) a second multiplier accepting as inputs the time from the store replay unit means and the output of the slow saw-tooth generator,

(p) a second adder accepting as inputs the output of the first adder and the output of the second multiplier,

(q) a third adder accepting as inputs the output of the second adder and the output of the slow saw-tooth generator, and supplying its output to the first Y-deflection amplifier for deflecting the first cathode-ray tube in the Y direction,

(r) a first subtracter accepting as its first input the output of the second adder and as its second input the output of the slow saw-tooth generator, the second input being subtracted from the first in the subtracter to produce a difference output which is supplied to the second Y-deflection amplifier for deflecting the second cathode-ray tube in the Y direction, and

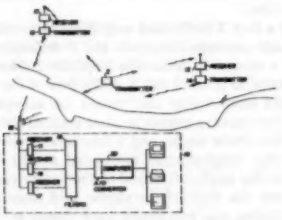
(s) means for coupling the output from the fast saw-tooth generator to both the first and second X-deflection amplifiers to deflect the first and second cathode tubes in the X-direction.

4,433,335

LOCATING DEVICE

David W. Wind, Dartmouth, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed May 16, 1978, Ser. No. 909,398
Claims priority, application Canada, May 31, 1977, 279484
Int. Cl.³ G01S *3/02*
U.S. Cl. 343—463 **13 Claims**



1. Apparatus for determining the location of a transmitter comprising:

(a) receiving means including at least two spaced receivers for receiving electromagnetic radiation from the transmitter,

(b) means for demodulating said radiation individually from each of said receivers,

(c) means for Fourier transforming the demodulated radiation from each of said receivers, and for providing signals representative of the radiation as a function of frequency,

(d) means for performing a complex division of each of said signals, to establish a signal representing the phase difference between the demodulated radiation from each of the signals, and

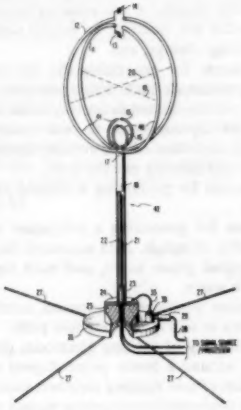
(e) means for providing a signal representative of the time difference based on said phase difference for defining a hyperbolic surface of rotation on which the transmitter is located.

4,433,336

THREE-ELEMENT ANTENNA FORMED OF ORTHOGONAL LOOPS MOUNTED ON A MONOPOLE

Alan R. Carr, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 5, 1982, Ser. No. 346,314
Int. Cl.³ H01Q *7/00*
U.S. Cl. 343—728 **9 Claims**



1. A three-element antenna comprising:

a monopole antenna; and

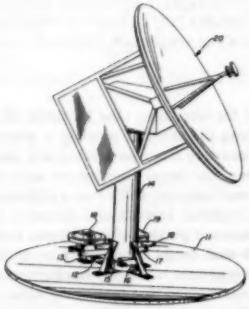
first and second loop antennas mounted on and electrically coupled to one end of said monopole antenna, said loop antennas having axes orthogonal to one another and to a longitudinal axis of said monopole antenna, each of said loop antennas comprising an outer primary loop and a smaller inner secondary loop disposed in the same plane as that of said primary loop and electrically coupled thereto.

4,433,337

PASSIVE STABILIZATION CONVERSION UNIT

Dorsey T. Smith; Albert H. Bieser, both of Garland, and Warren H. Kintzinger, Richardson, all of Tex., assignors to Tracor BEI, Inc., Garland, Tex.

Filed Jul. 22, 1980, Ser. No. 171,247
Int. Cl.³ H01Q *1/18*
U.S. Cl. 343—765 **18 Claims**



1. In a combination gyro and pendulum weight passive stabilization sending conversion interconnect and stabilized receiving structure system: combination dual axis gyro and

pendulum weight passive stabilization sending means; a dynamically balanced dual axis gimbal mounted stabilized receiving unit physically mountable separately and remotely from the sending means; dual axis conversion interconnect structure; with first electrically actuatable interconnect means electrically connected between a first axis of the dual axis of said gyro and pendulum weight passive stabilization sending means and the corresponding first axis of said stabilized receiving unit, and with second electrically actuatable interconnect means electrically connected between a second axis of the dual axis of said gyro and pendulum weight passive stabilization sending means and the corresponding second axis of said stabilized receiving unit; with electrically actuatable decoupling means for electrically decoupling said first interconnect means and said second interconnect means; and wherein each said first and second independent interconnect means includes motion to signal translation means; signal transmission means; and signal to motion translation means.

4,433,338

MULTIPLE-COLOR RECORDING APPARATUS

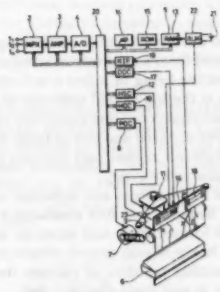
Shuichi Nakagawa; Sadao Tamura; Setsuo Satoh; Mamoru Sanagi; Hirosho Otsu; Shigenobu Miyamoto, and Hiroyuki Takahashi, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,783

Claims priority, application Japan, Mar. 31, 1981, 56-45896[U]; May 22, 1981, 56-77734

Int. Cl.³ G01D *9/32*

U.S. Cl. 346—34 **4 Claims**



1. A multiple color recording apparatus comprising

an input switching mechanism for successively selecting and delivering a plurality of input analog signals;

a signal converter for converting said plurality of input analog signals into digital signals;

a first memory for temporarily storing said digital signals;

a paper feed mechanism for feeding and moving a sheet of recording paper;

a recording means for recording dots in multiple colors on said sheet of recording paper, said recording means comprising a plurality of recording elements arranged along a direction transverse to direction of travel of said recording paper for recording different colors of dots;

a head scanning mechanism for scanning said recording means;

a second memory for temporarily storing digital signal related to the position of said recording means; and

a processing unit operable on a predetermined program for reading all data out of said first memory and data out of said second memory, said unit adapted to effect a phase correction by a phase difference signal related to a reference recording element of each of said recording elements for correcting the color dot recording position to a predetermined position allocated to each data stored in said first memory and thereupon detect selective data out of said phase corrected data stored in said first memory having a minimum difference with said data stored in said second memory, and for moving said recording means along the direction of scanning by a selected interval in response to said minimum difference and for enabling said recording means to print dots on said sheet of recording paper when said minimum difference falls to zero, thereby to produce analog recording of signal levels of a plurality of input analog signals in the form of a dot pattern of different colors allocated to said signals respectively.

4,433,339

DIRECT-WRITING RECORDER

Takehiko Sakaguchi, Nagano, Japan, assignor to Hioki Denki Kabushiki Kaisha, Nagano, Japan

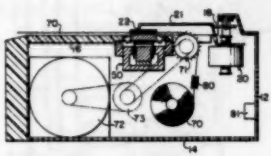
PCT No. PCT/JP81/00016, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02201, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 23, 1981, Ser. No. 305,630

Claims priority, application Japan, Jan. 23, 1980, 55-6520; Mar. 18, 1980, 55-34554

Int. Cl.³ G01D *15/02*

U.S. Cl. 346—78 **9 Claims**



1. In a direct-writing dot type recorder: printing means including a movable printing element for dot printing on a record medium; feeding means for intermittently feeding in a stepwise manner a record medium so as to intermittently position successive print areas of the record medium in spaced-apart relationship from the printing element; and means synchronized with the intermittent feeding of the record medium for periodically displacing the record medium toward the printing element so as to bring successive print areas of the record medium into contact with the printing element during the successive pause intervals occurring between the intermittent feeding motion of the record medium, said means for periodically displacing the record medium comprising an electromagnetic vibrator unit including a vibratable vibrator plate, a cover member attached to the vibrator plate, means defining a gap between the cover member and the vibrator plate and through which extends the record medium, means defining an opening in the cover member for receiving therethrough the printing end of the printing element, and electromagnetic means responsive to an electrical drive signal for electromagnetically vibrating the vibrator plate to effect displacement of the record medium toward the printing element to bring the record medium into contact with the printing end of the printing element.

4,433,340

OPTICAL RECORDING MEDIUM

Masao Mashita, Yokohama; Nobuaki Yasuda, Zushi, both of Japan; Tomoyuki Ishibashi, deceased, late of Yokohama, Japan, and Satoshi Ishibashi, legal representative, Himeji, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 22, 1982, Ser. No. 360,665

Claims priority, application Japan, Apr. 3, 1981, 56-49392

Int. Cl.³ G01D *15/34*

U.S. Cl. 346—135.1 **16 Claims**

1. An optical recording medium comprising:

recording layer means including a mixture layer containing

tellurium as a base material and at least carbon at a predetermined ratio, for receiving an energy beam such as a laser beam whose intensity is changed in accordance with quantized information and for recording desired information by melt-deforming in response to the intensity of the energy beam, and

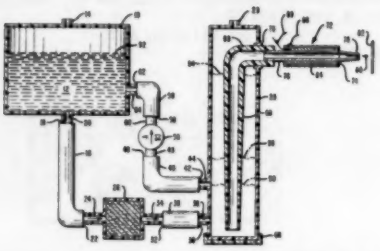
substrate means for supporting said recording layer means.

4,433,341

INK LEVEL CONTROL FOR INK JET PRINTER

Jacob E. Thomas, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 7, 1982, Ser. No. 385,965
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **18 Claims**



1. Means for controlling the level of ink in an ink jet printing system comprising

first means containing a quantity of ink,

second means containing a quantity of ink,

means providing an ink supply line and an ink return line connecting the first and the second ink containing means,

means operably associated with said second containing means for ejecting ink in droplet form,

means for moving said second containing means in reciprocating manner to thereby effect pumping of ink between the second and the first containing means, and

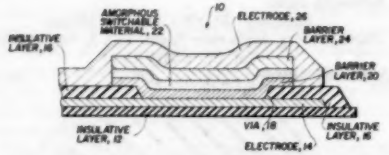
means associated with the ink return line for permitting intermittent flow of ink therethrough from the second to the first containing means and establishing a first ink level in the second containing means during printing operation and for allowing flow of ink through the ink supply line from the first to the second containing means and establishing a second ink level in the second containing means during non-printing.

4,433,342

AMORPHOUS SWITCHING DEVICE WITH RESIDUAL CRYSTALLIZATION RETARDATION

Vipin N. Patel, Melbourne, and John L. Conarroe, Jr., Melbourne Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 6, 1981, Ser. No. 251,106
Int. Cl.³ H01L *45/00*
U.S. Cl. 357—2 **2 Claims**



1. An amorphous semiconductor device switchable from a high resistance amorphous state to a low resistance crystalline state comprising:

a pair of electrode structures;

a layer of amorphous germanium telluride forming the switchable layer between said pair of electrode structures; and

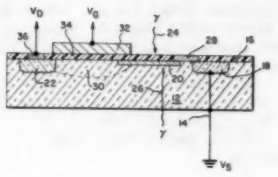
a thin retarding layer of amorphous germanium material between said germanium telluride layer and each electrode structure.

4,433,343

EXTRINSIC INFRARED DETECTOR WITH DOPANT SITE CHARGE-NEUTRALIZATION

Michael A. Levine, 261 E. Alegria Ave. #22, Sierra Madre, Calif. 91024

Filed Dec. 22, 1981, Ser. No. 333,465
Int. Cl.³ H01L *27/14, 29/78*
U.S. Cl. 357—30 **6 Claims**



1. A monolithic infrared detector comprising:

a substrate formed from a substrate of semiconductive material, said substrate being of a first conductivity type;

a detector area at the top of said substrate of extrinsic semiconductive material consisting essentially of said substrate semiconductive material and one or more dopants to form an extrinsic detector region, said detector region being of a second conductivity type;

a source region formed from said substrate semiconductive material and being of said first conductivity type;

a drain channel formed from said substrate semiconductive material and being of said second conductivity type;

means for permitting the flow of carriers from within said detector area to said drain channel; and

an external electrical contact between said source region and said detector area whereby charge neutrality at an extrinsic material site within said detector area may be maintained by carrier conduction from said source region through said external contact into said detector region and through said detector region to said extrinsic material site after a carrier at said site has been excited by a photon of infrared light and has flowed to said drain channel.

4,433,344

AUTOMATIC TELEVISION ANTENNA CONTROL SYSTEM

James H. Gradin, Irvine, and John S. Joseph, Los Alamitos, both of Calif., assignors to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Nov. 25, 1981, Ser. No. 324,902
Int. Cl.³ H04B *7/08*; H01Q *3/24*
U.S. Cl. 358—181 **16 Claims**

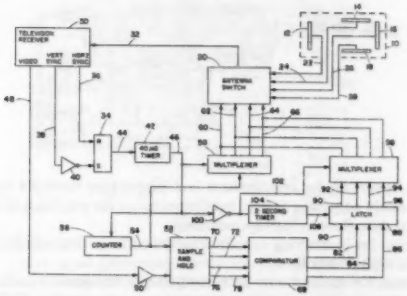
1. A television antenna control circuit for use with a television receiver and an antenna system having a plurality of directional antennas comprising:

antenna switch means for selectively connecting each of the directional antennas to the television receiver;

sampling means operatively connected to the television receiver and to said antenna switch means for sampling a video output signal of the television receiver for each directional antenna;

comparator means operatively connected to said sampling means for comparing said video output signals for each directional antenna selected and generating a logic signal representing the antenna producing the strongest video signal;

timing means operatively connected to said antenna switch means and said sampling means as well as the television receiver for causing said sampling means to selectively sample the video output signal for each directional antenna for a predetermined amount of time in response to synchronizing signals from the television receiver; and



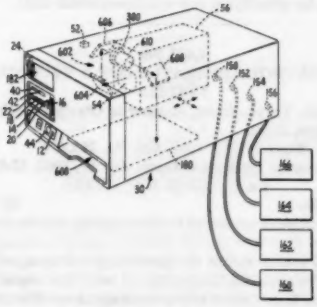
antenna control means operatively connected to said comparator means and said antenna switch means for connecting the directional antenna producing the strongest video signal to the television receiver in response to said logic signal.

4,433,345

VIDEO IMAGE RECORDING METHODS AND DEVICES

David H. Haddick, Berkeley; George E. Lyon, San Francisco, and David A. Menzimer, Morgan Hill, all of Calif., assignors to LogE/Dunn Instruments, Inc., San Francisco, Calif.

Filed Jun. 19, 1981, Ser. No. 275,257
Int. Cl.³ H04N *5/84*
U.S. Cl. 358—244 **20 Claims**



1. A video image recording device for photographically recording video generated images having a brightness level for exposing a photographic emulsion within limits of an exposure range, further comprising:

first index value display means for displaying selected values of a first index, each of which corresponds to a particular value of video image display screen light output;

second index value display means for displaying selected values of a second index, each of which corresponds to a particular value of video image display screen light output, said first and second index values representing intensity limitations for said image brightness level;

a first index value display control means for manually controlling the magnitude of the index value displayed by said first index value display means;

second index value display control means for manually controlling the magnitude of the index value displayed by said second index value display means, whereby an operator may select and display desired index values representing brightness level requirements for said images;

a first plurality of memory storage locations for storing plural representations of particular values of said first index; and

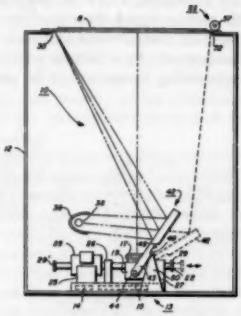
a second plurality of memory storage locations for storing plural representations of particular values of said second index, whereby said video recording device is provided with information for determining the brightness levels of said images for specific films.

4,433,346

RASTER INPUT SCANNER

James C. Stoffel, Rochester; Ned J. Seachman, Penfield; Jack R. Hauber, Webster, and William Kingsley, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1982, Ser. No. 364,131
Int. Cl.³ H04N *1/10, 1/12*
U.S. Cl. 358—293 **8 Claims**



1. A high speed raster input scanner comprising a transparent platen for supporting documents to be scanned; lamp means for providing a wedge-shaped beam of light to illuminate at least N lines of the document thereon; a movable mirror for sweeping said beam across said platen; at least one scanning array; said array comprising a two dimensional array for reading N image lines; optical means interposed between said platen and said array for focusing N image lines of said document on said array; and drive means to move said document in synchronism with scanning operation of said array to scan said document lines N times whereby to enhance the operational speed of said scanner, and where said document is supported on said platen, said drive means moving said lens means and said mirror in synchronism with scanning operation of said array to scan said document lines N times whereby to enhance the operational speed of said scanner.

4,433,347

APPARATUS FOR AUTOMATICALLY REPRODUCING SIGNALS IN ACCORDANCE WITH A MODE OF THE RECORDED SIGNALS

Hiroyuki Sugiyama, Isehara; Kenji Yoshihara, Chiba; Yasuhiro Yusa, Fujisawa; Ryozo Abe, and Masaki Sakurai, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 18, 1981, Ser. No. 293,834
Claims priority, application Japan, Aug. 19, 1980, 55-113761
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—342 **6 Claims**

1. An apparatus for reproducing signals from a rotary recording medium which may be either a first type or a second

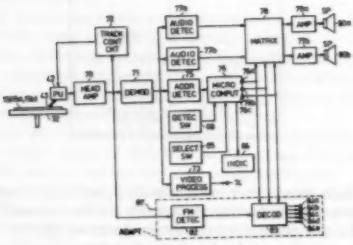
type rotary recording medium, said first type rotary recording medium being prerecorded with a video signal as a main information signal, audio signals accompanying the video signal, and an address signal including a mode discriminating code which indicates which one of four anticipated modes of audio signals are recorded thereon, said second type rotary recording medium being prerecorded with audio signals as main information signals and an address signal including a mode discriminating code which indicates which one of four anticipated modes of signals are recorded thereon,

detecting means for detecting at least the type of rotary recording medium which is to be reproduced, and for producing a detection signal which at least includes a code indicating the detected type of rotary recording medium;

reproducing means for reproducing the recorded signals from said rotary recording medium;

address signal detecting means for detecting the address signal from among the signals reproduced by said reproducing means;

a micro-computer means responsive to the detection signal from said detecting means and the detected address signal from said address signal detecting means, for detecting the mode discriminating code included within the address signal, and for producing a two-bit mode control signal and a one-bit muting signal through three output ports thereof, said two-bit mode control signal specifying one of four reproducing modes by which the reproduced signals from said reproducing means are to be processed, said one-bit muting signal indicating the type of rotary recording medium which is being reproduced;



a first signal processing circuit means responsive to said two-bit mode control signal and to said one-bit muting signal and to the reproduced signals from said reproducing means, for processing the signals reproduced by said reproducing means according to the reproducing mode specified by said two-bit mode control signal when said one-bit muting signal indicates that said first type rotary recording medium is being reproduced; and

a second signal processing circuit means responsive to said two-bit mode control signal and to said one-bit muting signal from said micro-computer and to the reproduced signals from said reproducing means, for processing the signals reproduced by said reproducing means according to said two-bit mode control signal when said muting signal indicates that said second type rotary recording medium is being reproduced,

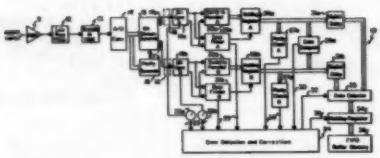
four codes comprising said two-bit mode control signal being commonly used to specify four reproducing modes by which signals reproduced from said first type rotary recording medium are to be processed and four reproducing modes by which signals reproduced from said second type rotary recording medium are to be processed.

4,433,348

APPARATUS AND METHOD FOR REQUIRING PROPER SYNCHRONIZATION OF A DIGITAL DATA FLOW

Thomas G. Stockham, Jr., and Bruce C. Rothaar, both of Salt Lake City, Utah, assignors to Soundstream, Inc., Salt Lake City, Utah

Division of Ser. No. 55,689, Jul. 6, 1979, Pat. No. 4,328,689.
This application Sep. 8, 1981, Ser. No. 299,829
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—51 **4 Claims**



1. Apparatus for arrangement in a digital tape recorder for accurately acquiring proper synchronization for playback of a digital data flow at startup including,

means for identifying synchronization codes in data words in a digital data flow;

means for locking onto an identified synchronization code;

locator means arranged for counting a certain number of bits from said identified synchronization code to look for a following synchronization code;

counter means arranged for counting the numbers of properly located synchronization codes and failures to locate synchronization codes, which counter means will subtract the failures to locate from the properly located synchronization codes; and

declaration means arranged to receive from said counter means the number of properly located synchronization codes less the failures to locate for, when a certain number of properly located synchronization codes are located, declaring synchronization and initiating recorder playback and, when the number of properly located synchronization codes less the failures to locate reaches zero, declaring synchronization not found and reactivating the means for identifying any synchronization code.

4,433,349

BIAS CONTROL APPARATUS FOR A RECORDING SYSTEM

Kenji Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1981, Ser. No. 282,074
Claims priority, application Japan, Jul. 17, 1980, 55-97824
Int. Cl.³ G11B *5/47, 27/36*
U.S. Cl. 360—66 **24 Claims**

1. A bias control apparatus for a recording system, comprising:

(a) signal source means for generating a first signal and a second signal, the frequency of said first signal being different from that of said second signal and the envelope of said first signal corresponding to said second signal;

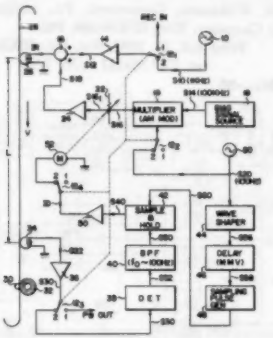
(b) bias signal generating means coupled to said signal source means for providing a composite bias signal containing a frequency component of said second signal and another frequency component at a frequency higher than that of said frequency component of said second signal;

(c) recording means coupled to said bias signal generating means and to said signal source means for recording information of said composite bias signal and said first signal into a recording medium;

(d) playback means coupled through said recording medium to said recording means for taking out a third signal containing a signal component corresponding to said first and second signals from said recording medium;

(e) detecting means coupled to said playback means for detecting a fourth signal corresponding to the amplitude component of said second signal from said third signal; and

(f) control means coupled to said detecting means and to said



bias signal generating means for changing a magnitude of said composite bias signal based on said fourth signal;

said bias signal generating means, said recording means, said playback means, said detecting means and said control means cooperatively forming a servo loop for controlling said composite bias signal to a given magnitude.

4,433,350

TRACKING ERROR DETECTION SYSTEM IN A MAGNETIC REPRODUCING APPARATUS

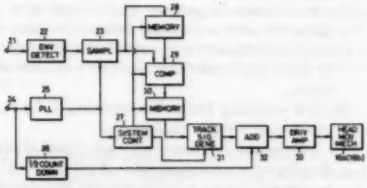
Masahiko Tsuruta, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 30, 1981, Ser. No. 316,777

Claims priority, application Japan, Nov. 4, 1980, 55-154874

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—70 **6 Claims**



1. A tracking error detection system in a magnetic reproducing apparatus having M rotary heads, where M is an integer, said M rotary heads respectively and successively scanning over oblique tracks on a magnetic tape to reproduce a signal which has been recorded on said magnetic tape, said system comprising:

square wave signal generating means for generating a square wave signal having a waveform which repeats a rise and fall cycle per 2 M·T period, where T is a period in which one of said M rotary heads scans over one track;

head moving means responsive to said square wave signal for moving at least one rotary head in a direction perpendicular to the longitudinal direction of the track;

detecting means for detecting the level of a signal reproduced by said one rotary head when said one rotary head scans at least one position at a predetermined distance from an end part of a track along the longitudinal direction of the track; and

comparing means supplied with the detected level from said detecting means, for comparing a pair of successively detected levels of the signals reproduced by said one rotary head to detect tracking error.

4,433,351

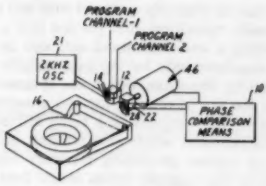
SYSTEM FOR REDUCING PHASE ERROR IN MULTITRACK MAGNETIC RECORDING

Peter J. Vogelgesang, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1980, Ser. No. 211,265

Int. Cl.³ G11B *5/43*; H01F *7/00*

U.S. Cl. 360—76 **2 Claims**



1. In an analog audio record/playback system capable of recording and playing back multiple tracks of program information, such as are present within a stereo signal, onto or from an appropriate magnetic medium; the improvement comprising an assembly for achieving and maintaining upon playback of the medium, the correct phase relationship between the tracks of program information recorded on the medium, said assembly including:

record transducer means including a record head having at least four gaps disposed in a transversely spaced relationship with respect to the medium, and adjacent the medium to afford the recording of information into at least four parallel tracks, each extending longitudinally with respect to said medium;

playback transducer means including a playback head having at least four gaps disposed in a transversely spaced relationship with respect to the medium, and adjacent the medium to afford the playback of the information recorded thereon;

oscillator means for supplying an electrical signal oscillating at a predetermined frequency;

a first two of said at least four gaps and the associated record transducer means adapted to be connected to a source of program information enabling the recording of program information on a first two of said four parallel tracks defined as program information tracks;

a second two of said at least four gaps and the associated record transducer means being connected to said oscillator means to enable said oscillator means to supply to said record transducer means a signal which is recorded in a known phase relationship onto a second two of said four parallel tracks defined as electrical signal tracks;

a first of said program information tracks being positioned proximate to the first edge of said medium, a first of said electrical signal information tracks positioned adjacent thereto, a second of said program information tracks positioned adjacent said first of said electrical signal tracks but on the side of said first of said electrical signal tracks closest to the second edge of said medium, and a second of said program information tracks positioned adjacent said second of program information tracks and proximate the second edge of said medium;

phase comparison means electrically connected to said playback transducer means for comparing and determining the phase relationship of the signal which originated from said oscillator means, which was recorded on said tracks by said record transducer means and played back by said playback transducer means, said phase comparison means having an output current which is proportional to the

magnitude and direction of any phase difference occurring between the signals as played back from said tracks; and

electrically responsive driver means mechanically coupled to said playback head and electrically coupled to said phase comparison means for rotating sid playback head about an axis perpendicular to said medium, a distance and direction determined by said output current, thus changing the azimuth angle of said playback head gaps with respect to said tracks to dynamically compensate for any phase difference determined by said phase comparison means;

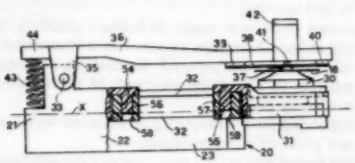
said driver means including a DC motor having a housing, an armature rotatably mounted with said housing having a generally cylindrical first portion and a second portion including a semi-cylindrical side and an angulated side, said angulated side having two radially opposing peaks projecting therefrom which are symmetrically disposed about the axis of rotation for said armature, and a pair of elongate field magnets each being affixed at radially opposing positions within said housing, and each having a peaked portion projecting inwardly from said housing whereby the magnetic forces of said field magnets tend to rotate said armature to a home position when no current is applied to said coil.

4,433,352

DEVICE FOR RECORDING AND/OR READING BINARY DATA ON BOTH FACES OF A FLEXIBLE MAGNETIC DISK

Giuliano De Marco, Ivrea, and Roberto Gemi, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jul. 1, 1981, Ser. No. 279,625
Claims priority, application Italy, Jul. 14, 1980, 68110 A/80
Int. Cl.³ G11B 5/58, 21/20
U.S. Cl. 360—105 8 Claims



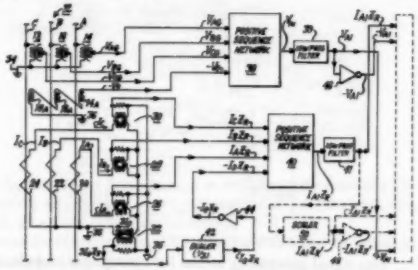
1. A device for recording and/or reading binary data on both faces of a flexible magnetic disk, comprising rotating means for rotating said disk, means for defining a nominal plane on which lies a first face of said disk, a carriage movable radially relative to said disk, a first magnetic head mounted on a support element for recording and/or reading binary data on said first face, said first magnetic head in a rest position interfering with said nominal plane of said disk by a predetermined amount, an arm having a first end pivoted with respect to said carriage and a second end movable towards a second face of said disk, a second magnetic head gimball mounted on the second end of said arm in an opposite position with respect to binary data on the second face of said disk, means for connecting said support element to said carriage in such manner that said support element and said first magnetic head can move only along an axis perpendicular to said nominal plane, said connecting means comprising a pair of leaf springs disposed parallel therebetween and substantially parallel to said nominal plane, each one of said leaf springs having a first extremity fixed to said carriage and a second extremity fixed to said support element, whereby said support element is cantilevered from said carriage and said two leaf springs, said carriage and said support element forming an articulated parallelogram, and urging means operating on said arm for urging said second magnetic head towards said second face of said disk with a predetermined load so as to modify in operation said predetermined amount of interference of said first magnetic head with said nominal plane.

4,433,353

POSITIVE SEQUENCE UNDERVOLTAGE DISTANCE RELAY

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Jul. 29, 1982, Ser. No. 403,269
Int. Cl.³ H02H 3/26, 7/26
U.S. Cl. 361—80 12 Claims



1. An undervoltage distance relay for association with a three phase transmission line and adapted to provide a blocking signal in response to the occurrence of a fault behind the relay but providing no blocking signal in response to the occurrence of a fault on the transmission line in front of the relay, the relay comprising:

(a) means for developing quantities $-V_1$, $+V_1$, and I_1Z_R, where:

V_1 is a signal representative of the positive sequence component of the phase to ground or phase to phase voltages of the transmission line,

I_1 is a signal representative of the positive sequence component of the phase currents of the transmission line when V_1 is related to phase to ground voltage and is a signal representation of the positive sequence component of the delta currents when V_1 is related to phase to phase voltage,

Z_R is a replica impedance of the equivalent positive sequence source impedance behind the relay and is of a magnitude equal to or greater than a quantity of a constant K times said equivalent positive sequence source impedance,

(b) first summing means for summing I_1Z_R and $-V_1$ and developing a signal $(I_1Z_R-V_1)$,

(c) first means for receiving said signal $(I_1Z_R-V_1)$ and developing an output signal $(-K)(I_1Z_R-V_1)$, where K is a constant having a value selected between the range of 0.5 to 1.0 and has an out-of-phase relationship with $(I_1Z_R-V_1)$, said first means having a short term memory that enables it to continue developing said output signal after removal of or change to the received signal,

(d) second summing means for receiving and summing together said signals $(I_1Z_R-V_1)$ and $(-K)(I_1Z_R-V_1)$, so as to develop a signal $(1-K)(I_1Z_R-V_1)$, expressed as an operating V_{OP} signal,

(e) second means for receiving said $+V_1$ signal and developing a polarizing signal V_{POL} representative of the $+V_1$ signal, said second means having a short term memory that enables it to continue developing said polarizing signal after removal of or change to the received $+V_1$ signal, and,

(f) coincidence detection means for comparing the phase of the operate signal V_{OP} with the phase of the polarizing signal V_{POL} and developing a blocking signal when the phase coincidence between V_{OP} and V_{POL} exceeds a predetermined duration.

4,433,354

GAS-DISCHARGE SURGE ARRESTER

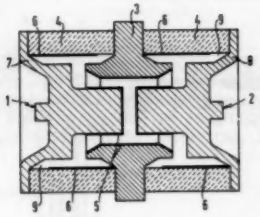
Gerhard Lange, and Jürgen Boy, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,157

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100924

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—120 **5 Claims**



1. Gas-discharge two-path surge arrester having two axially opposing main electrodes defining a discharge gap therebetween and a middle electrode coaxially and annularly surrounding the discharge gap and connected to the main electrodes, respectively, by a tubular insulating housing, at least one strip of electrically conductive material disposed on the inner surface of the tubular housing and extending over a part of the length thereof, comprising respective elastic transition members disposed at the ends of the tubular insulating housing, said transition members respectively forming a part of the main electrodes, each of the main electrodes being formed of an outer cylindrical part of relatively larger diameter having a substantially planar end face and an inner cylindrical part of relatively smaller diameter integral with and extending substantially coaxially to the outer cylindrical part from said substantially planar end face thereof, the respective inner cylindrical parts of the main electrodes being juxtaposed and being disposed in stepped relationship to their respective outer cylindrical parts of larger diameter, the main electrodes forming a discharge path, the middle electrode being formed as a hollow cylinder having outwardly flaring conical inner surfaces at the ends thereof and forming a respective main discharge path with both of the main electrodes, the main electrodes and the middle electrode being mutually overlapping at a region whereat they are provided with an electrode activating material.

4,433,355

ELECTRONIC LOCKS FOR DOORS

Ivan Chew, Wolverhampton, and John Verhaeg, Kingswinford, both of England, assignors to Yale Security Products Ltd., Willenhall, England

PCT No. PCT/GB81/00029, § 371 Date Nov. 3, 1981, § 102(e) Date Nov. 3, 1981, PCT Pub. No. WO81/02603, PCT Pub. Date Sep. 17, 1981

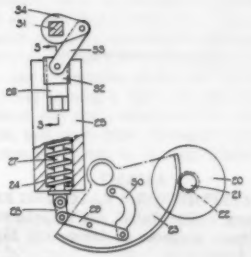
PCT Filed Feb. 27, 1981, Ser. No. 320,972

Claims priority, application United Kingdom, Mar. 4, 1980, 8007325

Int. Cl.³ H01H *47/00*

U.S. Cl. 361—172 **13 Claims**

1. An electronic lock for a door comprising the combination of an operating member for displacing a locking element, an electronic circuit controlling the operation of the lock, said circuit being in a lock-operating condition only upon being electrically energised and upon receiving predetermined information supplied thereto by an authorized lock user, and electrical generator means mechanically connected to the operating member so as to generate electrical power for the lock and its electronic circuit when the operating member is moved, the generator means comprising resilient means drivingly connected to the operating member so as to store mechanical energy during initial movement of the operating member, release means operable by the operating member to release said



resilient means and connecting means connecting the resilient means to an electrical generator so that said resilient means, when released, drives the generator.

4,433,356

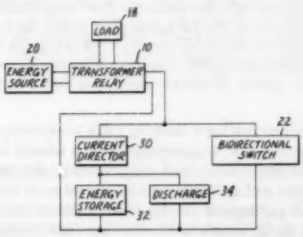
CONTROL CIRCUIT FOR TRANSFORMER RELAY

Gerald A. Wyatt, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1982, Ser. No. 369,837

Int. Cl.³ H01H *51/30, 47/00*

U.S. Cl. 361—191 **18 Claims**



1. A control circuit in combination with a transformer relay, said transformer relay having a primary winding adapted to be coupled to an alternating current energy source, having a load switch adapted to control the application of said energy source to a load, and having a secondary winding which controls said load switch to a selected position depending upon current flow in said secondary winding above a predetermined switching threshold in a selected direction, comprising;

first current directing means for allowing a flow of current in one direction only;

energy storage means for momentarily allowing a current flow upon application of energy before becoming charged; and

discharge means coupled to said energy storage means, and discharge means for allowing said energy storage means to substantially discharge while said control circuit is not activated;

said energy storage means and said first current directing means being coupled in series and being adapted to be coupled with said secondary winding of said transformer relay;

whereby current is momentarily allowed to flow in a selected direction in said secondary winding above said predetermined switching threshold upon activation of said control circuit, and

whereby said load switch of said transformer relay is con-

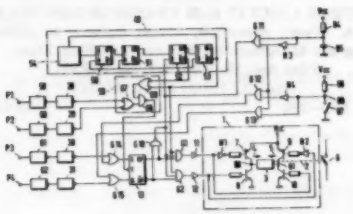
trolled to a selected position upon activation of said control circuit.

4,433,357

DRIVE CIRCUIT FOR A LATCHING RELAY

Hiromi Nishimura; Yoshie Watari, and Yuusaku Matsubara, all of Osaka, Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Filed Oct. 7, 1981, Ser. No. 309,397
Claims priority, application Japan, Oct. 13, 1980, 55-143536; Oct. 13, 1980, 55-143537; May 31, 1981, 56-83229
Int. Cl.³ H01H 47/18
U.S. Cl. 361—196 4 Claims



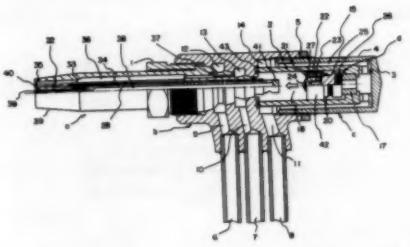
1. A drive circuit for a latching relay comprising a flip-flop responding to a first input signal and to a second input signal entered into the drive circuit and providing alternately a first control signal and an inverse control signal as an output corresponding to a change in the flip-flop's stable condition; a timer connected to the output of the flip-flop for receiving the first control signal and the inverse control signal; a semiconductor switching circuit connected to the timer with the timer controlling the semiconductor switching circuit for a constant time period, which produces a control signal in response to a first input signal and an inverse control signal to said control signal in response to a second input signal; a latching relay connected to the semiconductor switching circuit with the latching relay receiving from the semiconductor switching circuit a time limit output such that even if said first and second input signals are given to the drive circuit in an extremely short time after said timer responds to said control signal coming from the flip-flop, a sufficient time period is provided for said time limit output in order to energize and keep on said semiconductor switching circuit during the time period of current sufficient for said latching relay and where even when the output of said control signal is cut off between the first input signal and the second input signal, the latching relay keeps its existing relay working condition; a pair of delay circuits connected to the flip-flop for cutting a noise input signal; a pair of logic gates connected in series each to a corresponding one of the delay circuits; and an input-output terminal disposed at one of said series connected delay circuits and logic gates, which is connected in feedback to an input-output terminal of the other one of said series connected delay circuits and logic gates such that the stable condition of the flip-flop changes in response to said first and second input signals, and when the stable condition changes, a logical value of each output is temporarily made equal.

4,433,358

TORCH FOR CUTTING, WELDING OR HEATING

Yosinori Kubota, Kobe, Japan, assignor to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 16, 1982, Ser. No. 408,506
Claims priority, application Japan, Aug. 18, 1981, 56-128969; Feb. 15, 1982, 57-20504[U]; Feb. 26, 1982, 57-28087[U]
Int. Cl.³ F23Q 3/01
U.S. Cl. 361—260 10 Claims



9. A cutting, welding or heating torch comprising, in combination:

a nozzle having concentric tubular members with discharge ends forming a first pair of electrodes;

a piezoelectric assembly disposed within the pressure fluid channel portion of the torch head, the piezoelectric assembly including a second pair of electrodes respectively connected to the electrodes in said first pair and percussion means movable within said pressure fluid channel portion from a standby position to an operative position in response to the application of fluid pressure to said channel portion, said percussion means producing a high voltage across said second pair of electrodes upon the movement of the percussion means to said operative position to thereby form a spark across said first pair of electrodes; and

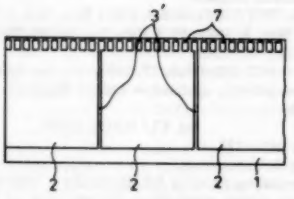
means for automatically returning the percussion means from its operative position to its standby position.

4,433,359

METALLIZED FILM CAPACITORS

Takeshi Hamabe, Nishinomiya, and Tatsuya Nakamura, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 12, 1982, Ser. No. 357,616
Claims priority, application Japan, Mar. 19, 1981, 56-41180; May 28, 1981, 56-82265; Jun. 19, 1981, 56-95856
Int. Cl.³ H01G 1/13, 3/10
U.S. Cl. 361—273 11 Claims



1. A metallized plastic film capacitor having at least one vapour-deposited metal layer electrode and a counter electrode characterized in that

(a) said at least one vapour-deposited metal layer electrode of the same polarity electrode formed of a metallized strip

which has been split into a plurality of segmental electrodes,

(b) each of the segmental electrodes of the same polarity being connected together at the same potential by an external connecting layer of a conducting material,

(c) each of the segmental electrodes, constituting a minute capacitor in combination with said facing counter electrode through a dielectric material layer interposed therebetween, and

(d) plural narrow paths for current being formed on at least one side face of confronting segmental electrodes.

4,433,360

TUBULAR CERAMIC CAPACITOR

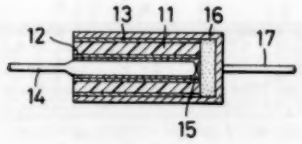
Kikuo Wakino, and Yoshio Arakawa, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 22, 1981, Ser. No. 313,963

Claims priority, application Japan, Oct. 24, 1980, 55-152751[U]

Int. Cl.³ H01G *1/01, 1/153*

U.S. Cl. 361—305 **5 Claims**



1. A tubular ceramic capacitor, comprising:

a tubular ceramic dielectric member having a bore of substantially uniform diameter formed through substantially the entire length thereof;

external and internal electrodes formed on the outer and inner surfaces, respectively, of said dielectric member;

a lead terminal formed of Dumet wire and extending from a position outside said dielectric member into said bore and through substantially the entire length of said bore, the portion of said lead terminal located in said bore using uniform and cylindrical in form and having a diameter substantially equal to the diameter of said bore;

a solder interfacing the outer surface of said lead terminal and internal electrode, said solder serving to both physically and electrically connect said lead terminal to said internal electrode; and

a conductive cap terminal having an inner diameter substantially equal to the outer diameter of said dielectric member and being fitted over the outer surface of said dielectric member so as to be in electrical contact with said external electrode, said cap terminal including a lead wire projecting from a closed end of said cap terminal.

4,433,361

COVER WITH ELECTRICALLY INSULATED CURRENT CONDUCTION

Franz-Josef Wolf, Sprudelallee 19, D-6483 Bad Soden-Salmunester, and Rudolf Klaschka, Tannenweg 9, D-7896 Wutoeschingen 3, both of Fed. Rep. of Germany

PCT No. PCT/EP81/00011, § 371 Date Jul. 15, 1981, § 102(e) Date Jul. 15, 1981, PCT Pub. No. WO81/02219, PCT Pub. Date Aug. 6, 1981

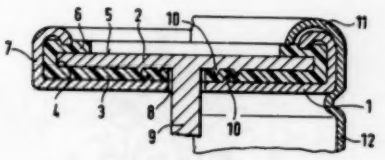
PCT Filed Jan. 30, 1981, Ser. No. 285,128

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003763

Int. Cl.³ H01G *9/00*; H01M *2/08*

U.S. Cl. 361—433 **11 Claims**

1. A cover with electrically insulated current leadthrough for closing cup-shaped compartments of electrical components, comprising a lead-through element in the form of a lead-through disc having a lead-through post extending therefrom, said lead-through post being integrally formed with said lead-through disc, a permeation-proof and electrical insulating material disposed over a first side of said lead-through disc, a cover plate disposed over said permeation-proof and electrical insulating material such that the latter is disposed between said cover plate and said lead-through disc, said cover plate and said permeation-proof and electrical insulating material having openings through which said lead-through post extends, said opening in said permeation-proof and electrical insulating material and said opening in said cover plate being of substantially the same size and configuration as that of said lead-through post, said cover plate having an outer diameter substantially extending at least to the outer diameter of said lead-



through disc, said permeation-proof and electrical insulating material having an outer edge portion extending around the outer edge and partially onto a second side, opposite said first side, of said lead-through disc, and connecting means mechanically securing said cover plate, said permeation-proof and electrical insulating material and said lead-through element together to thereby provide a sandwich construction arrangement consisting of said lead-through disc, said permeation-proof and electrical insulating material, and said cover plate with the aforesaid sandwich construction extending substantially from said lead-through post to the outer diameter of said lead-through disc to provide enhanced sealing of gases and vapors.

4,433,362

REMOTELY CONTROLLABLE ILLUMINATION APPARATUS

Itsuki Ban, 3-50-18, Higashi-oizumi, Nerima-ku, Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,926

Claims priority, application Japan, Aug. 18, 1980, 55-116095[U]

Int. Cl.³ H04M *1/22*

U.S. Cl. 362—86 **7 Claims**

1. A remote controllable illumination apparatus comprising:

a luminous body;

a microphone for producing an electric output signal upon receiving an acoustic signal generated from a remote sound generating source;

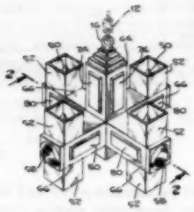
a filter circuit for removing frequencies corresponding to less than 5 KHz;

an amplifier circuit for amplifying said output signal of said microphone;

and

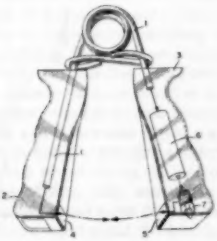
a lighting control circuit means for turning on said luminous body responsive to said amplified output signal and for turning off said luminous body after a predetermined period of time.

4,433,363
AUDIO LIGHT CHANDELIER
Franz K. Weber, Canoga Park, Calif., assignor to Modulite Corporation, Canoga Park, Calif.
Filed Jun. 9, 1982, Ser. No. 386,695
Int. Cl.³ H04M 1/22
U.S. Cl. 362—86 **9 Claims**



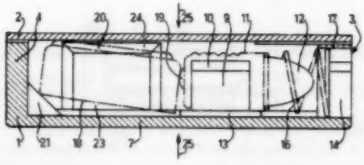
1. A composite illumination and audio system comprising, in combination:
a mechanical structure adapted to be suspended from a wall or ceiling;
an illuminating system supported by said mechanical structure;
an audio system also supported by said mechanical structure;
said mechanical structure providing a resonant cavity for said audio system; and
an electrical power supply circuit for furnishing electrical power both to said illuminating system and to said audio system.

4,433,364
LIGHTED HANDGRIP
Edward E. Noble, R.R. #1, Box 176, Edgewood Rd., Eureka, Ill. 61530
Filed Mar. 21, 1979, Ser. No. 22,721
Int. Cl.³ F21V 33/00
U.S. Cl. 362—109 **3 Claims**



1. A handgrip comprising,
a pair of elongated handles to be gripped by the hand and of a size to be engaged by the whole hand throughout the width of the hand,
means mounting the handles together for movement of the handles toward and from each other in pivotal movement about a pivot axis that is disposed longitudinally beyond the handles whereby substantially the whole body of the hand grip is disposed longitudinally beyond the pivot axis,
the mounting means including spring means biasing the handles apart and yielding to enable the handles to be moved toward each other into interengagement, and the spring means being of great strength whereby the handles can be moved into such interengagement only by the full strength of the hand,
the handgrip including an electrical circuit which itself includes a battery, light bulb, and contacts, one of the contacts being in each of the handles, and the contacts being exposed for interengagement in response to the handles being moved into interengagement, and effective when so interengaged for completing circuit and lighting the light bulb, the electric circuit being normally open and closed only when the handles are interengaged.

4,433,365
MINIATURE FLASHLIGHT
Jean P. Rousseau, 98, Rue de Miromesnil, 75008 Paris, France
Filed Mar. 28, 1983, Ser. No. 479,619
Claims priority, application France, Mar. 26, 1982, 82 05228
Int. Cl.³ F21L 7/00
U.S. Cl. 362—189 **6 Claims**



1. A miniature flashlight consisting of a case (1) of moulded plastics material closed by a cover (2) that is at least partly metallic and containing a cell (18), an electric bulb (11-12) and a pressure spring (16), the whole being of a flat shape and comprising two facing walls formed respectively by the bottom wall (7) of the case and by at least a portion of the cover (2); the cell (18) consisting of a flat cylindrical cell the casing of which is in contact with the centre contact stud (19) of the bulb and the opposite polarity contact of which is oriented towards the cover (2); the bottom wall (7) of the case (1) comprising parts (9, 10) to house and restrain the socket (11) of the bulb (12); and one at least of the said two facing walls (7 and 2) being flexible enough for compression of the whole unit between the fingers (25) to bring the socket (11) or the pile (18) contact (20) into contact with the conducting portion of the cover (2), characterized in that the pressure spring (16) is located between the bulb (12) and the light outlet opening (14) made in one end wall (3) and in that a ramp (21) is provided close to the other case (1) end wall (4) enabling the axial thrust of the spring (16), transmitted to the cell (18) by the centre contact stud (19) of the bulb (12), to be converted into a transverse thrust ensuring contact between the cell (18) conducting contact (20) and the conducting wall of the cover (2).

4,433,366
POOL LIGHT MOUNTING STRUCTURE
Charles E. Wade, 3601 S. Sentous, #E-149, West Covina, Calif. 91792
Filed Sep. 30, 1982, Ser. No. 429,538
Int. Cl.³ F21V 29/00
U.S. Cl. 362—267 **11 Claims**

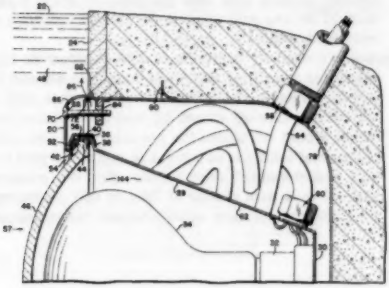
1. A structure for mounting an electrical light bulb under water to a construction such as a swimming pool, the structure including:
a light bulb enclosure having:
a body with:
an outer circumferential flange; and
a frustroconical portion adjacent said outer circumferential flange;
a light bulb socket within said body;

a waterproof connection to said light bulb socket through said body;

a lens with:

an outer circumferential flange positioned adjacent said outer circumferential flange of said body; and

a seal between said outer circumferential flange of said



body and said outer circumferential flange of said lens; and

a mounting ring having:

a frustroconical inner portion in contact with said seal; and

means for connecting said mounting ring to the construction.

4,433,367

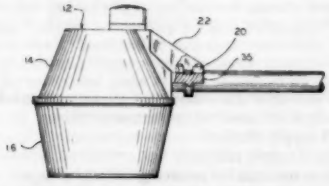
LUMINAIRE MOUNTING STRUCTURE

Billy L. Shelby, Memphis, and Giovanni DeCandia, Germantown, both of Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 18, 1983, Ser. No. 467,749

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—370 **9 Claims**



1. Mounting structure for affixing the housing of an outdoor luminaire on a substantially horizontal, generally cylindrical mast, said structure including a discontinuous tubular body integrally secured to said housing and forming a bore adapted to receive the mast therein, an end face of said luminaire forming the inner end of said bore to butt against the end of the mast, said body comprising a first semi circular section integrally connected to said end face, a second semi circular section spaced axially from the first section with an air space separating said two sections axially, and with said sections aligned to enclose a like portion of the mast, and a single semi circular section diametrally aligned with the air space intermediately between said first and second sections with the single section joined to the first and second sections at the axial ends of the single section, and a reinforcing boss at the center of the single section adapted to receive a set screw therein to bear against the mast to support said housing on said mast.

4,433,368

POWER SUPPLY CIRCUIT FOR A VARIABLE ELECTRICAL SOURCE

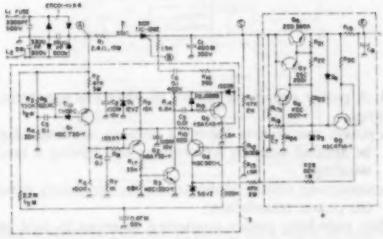
Hak-Ki Choi, Kyungki, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Jan. 5, 1982, Ser. No. 337,162

Claims priority, application Rep. of Korea, Apr. 1, 1981, 1981/2305[U]; Apr. 1, 1981, 1981/2306[U]; Apr. 1, 1981, 1981/2307[U]; Apr. 1, 1981, 1981/2308[U]

Int. Cl.³ H02M *1/14*

U.S. Cl. 363—45 **3 Claims**



1. An AC to DC converter circuit for use with AC supply signals of various voltages, comprising:

a rectifying circuit which produces rectified current at its output when connected directly to a source of alternating current having any voltage within a broad range;

a phase-controlling element connected to the output of the rectifying circuit for controlling the phase of the rectified current signal;

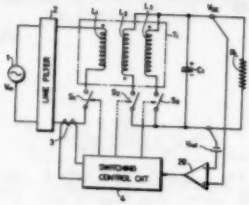
a trigger signal-generating circuit for generating a trigger signal for regulating the operation of the phase-controlling element;

a ripple-removing filter circuit connected to the output of said phase-controlling element for removing the ripple component of the DC signal and for providing a relatively constant and substantially ripple-free output signal at an output terminal for energizing an electrical appliance, comprising: a first resistor and first capacitor connected in series between the input of the ripple-removing circuit and ground; at least two transistors arranged in Darlington configuration having their collectors connected to the input of the ripple-removing circuit, the base input of the first Darlington transistor connected to the junction point of the first resistor and first capacitor through a first diode, and the emitter output of the last Darlington transistor connected to the output of the filter circuit, said filter circuit also having rapid start-up means for conducting the Darlington configuration transistors more quickly relative to the time constant of the first resistor and first capacitor, said rapid start-up means comprising a second resistor and second capacitor connected in parallel with, and having a time constant shorter than, the first resistor and first capacitor; and a second diode connected between the base input of the first Darlington transistor and the junction point of the second resistor and second capacitor, said second diode having a smaller forward voltage value than said first diode.

4,433,369
POWER SUPPLY CIRCUIT FOR ELECTRICAL APPARATUS

Masao Noro, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 17, 1982, Ser. No. 359,162
Claims priority, application Japan, Mar. 24, 1981, 56-042775
Int. Cl.³ H02P 13/26
U.S. Cl. 363—84 13 Claims



1. A power supply circuit for an electrical apparatus, comprising:

a power transformer having a primary winding adapted to be applied with an AC voltage and having a secondary winding;

a smoothing circuit connected to the secondary winding of the power transformer;

first switching means connected in series to said primary winding for applying said AC voltage to said primary winding of said transformer with timing which is at least twice during each one-half cycle of said AC voltage; and

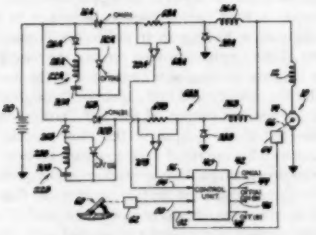
first detecting means for detecting a current value of said primary winding to control the switching timing of said first switching means by virtue of a result of its detection;

the controlling of said switching timing being performed so that the current value of said primary winding is kept from exceeding a predetermined value, in such manner that when the current value of the primary winding is less than the predetermined value, the AC voltage is supplied to the primary winding, and that this supply is suspended when the predetermined value is reached.

4,433,370
MULTIPLE PHASE CHOPPER CURRENT LIMITING

Sam M. Karadsheh, Troy, and Thomas A. Radomski, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1982, Ser. No. 362,274
Int. Cl.³ H02M 3/315; H02P 7/28; H02H 7/122
U.S. Cl. 363—124 5 Claims



1. A chopper mechanism of the type wherein current from a common source is sequentially applied to a load through at least two separate current paths in like duration pulses and at a common repetition rate and wherein the current turn-off in each path must be either after or more than a predetermined time prior to the initiation of current flow in the other path to ensure reliable current commutation, the improvement comprising:

phase control means normally effective to initiate current flow in the paths according to a predetermined phase relationship;

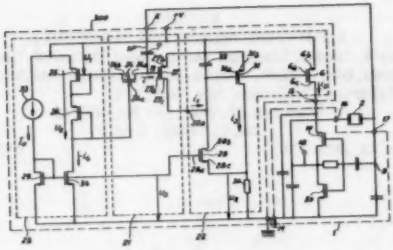
overcurrent turn-off means responsive to the magnitude of current in each path and operative to cause a current turn-off for any path wherein the current exceeds a reference limit; and

means activated by operation of said overcurrent turn-off means for overriding said phase control means and delaying the initiation of current flow in the other path when the current turn-off caused by said overcurrent turn-off means would fall within the predetermined time prior to the normal initiation of current in said other path so that said predetermined time occurs after the overcurrent turn-off by a time at least as long as said predetermined time, thereby ensuring reliable current commutation.

4,433,371
CONVERTER FOR CONVERTING AN A.C. VOLTAGE INTO A DIRECT CURRENT AND AN OSCILLATOR CIRCUIT USING SAID CONVERTER

Oskar Leuthold, Tschugg, Switzerland, assignor to Ebauches, Electroniques, S.A., Switzerland

Filed Sep. 24, 1981, Ser. No. 305,276
Claims priority, application Switzerland, Oct. 16, 1980, 7730/80
Int. Cl.³ H02M 7/217; H03B 5/36
U.S. Cl. 363—127 7 Claims



1. A converter for converting an a.c. voltage having an amplitude A into a direct current, comprising:

a first supply terminal;

a second supply terminal;

an input terminal for receiving the a.c. voltage;

an output terminal for outputting the direct current i_3;

a first elementary converter connected to said input terminal for receiving the a.c. voltage, said first elementary converter producing a pulsed direct current, the mean value of which is a steeply rising function of the amplitude A of the a.c. voltage; and

a second elementary converter connected to said first elementary converter for receiving said pulsed direct current for producing at said output terminal the current i_3, the value of which is a steeply falling function of said means value of said pulsed direct current such that there is in a certain range of values of A, substantially:

$$i_3 = C_1(A_M - A)$$

in which C_1 is a constant parameter and A_M is a particular value of A in said range of values.

4,433,372

INTEGRATED LOGIC MOS COUNTER CIRCUIT

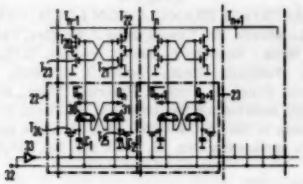
Dieter Eichrodt, and Friedhelm Elsen, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 94,931, Nov. 16, 1979, Pat. No. 4,323,982, which is a continuation of Ser. No. 841,798, Oct. 13, 1977, abandoned. This application Dec. 15, 1981, Ser. No. 330,891

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647982

Int. Cl.³ H03K 21/16

U.S. Cl. 377—116 3 Claims



1. A multi-stage logic circuit operable as a synchronous binary counter comprising:

a plurality of increasingly significant counter stages for each digit of a multi-digit binary number to be counted;

each counter stage including

a bistable trigger stage having first and second signal inputs and having two complementary outputs forming the outputs for the counter stage containing the bistable trigger stage, said inputs assuming one of two possible states in dependence upon the value of the binary digit supplied to said first signals inputs thereof,

a first pair of transfer transistors having respective control electrodes for receiving the complement of said binary digits applied to said first signal inputs,

a carry signal input for receiving a carry signal from an immediately preceding less significant counter stage,

a carry signal output connected to a carry signal input for an immediately following more significant counter stage,

a transfer gate having two second pairs of series-connected transfer transistors, the controlled paths of said second pairs of transfer transistors each being connected to said carry signal input and the control electrodes of each of said second pairs of transfer transistors being mutually cross-coupled and being additionally respectively connected to said complementary outputs of said bistable trigger stage, the series-connected nodes of the controlled paths of each of said second pairs of transfer transistors being respectively connected to said second signal inputs of said bistable trigger stage through the respective controlled paths of said first pair of transfer transistors, and the series-connected node of the controlled paths of one of said second pairs of transfer transistors forming said carry stage output.

4,433,373

APPARATUS FOR PROGRAMMING NUMERICALLY PATH CONTROLLED PROCESSING DEVICES

Walter Miller, Traunstein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,098

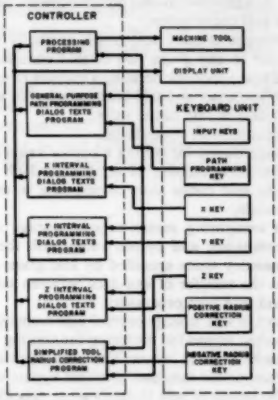
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028708

Int. Cl.³ G06F 15/46

U.S. Cl. 364—171 10 Claims

1. In a programmable, numerically path controlled processing device of the type comprising a multiple axis controller for controlling the processing device along at least two axes; a display unit coupled to the controller; means, included in the controller, for displaying on the display unit a first set of dialog texts suitable for multiple axis path programming; and a keyboard input unit comprising input key means for the entry of digital programming data to the controller, the improvement comprising:

means, included in the controller, for displaying on the display unit a second, abbreviated set of dialog texts,



simpler than the first set of dialog texts, each of said second set of dialog texts suitable for single axis, axially parallel interval programming of paths parallel to a respective one of the at least two axes, but unsuitable for multiple axis path programming; and

means for selectively activating a selected one of the means for displaying the first set of dialog texts and the means for displaying the second set of dialog texts.

4,433,374

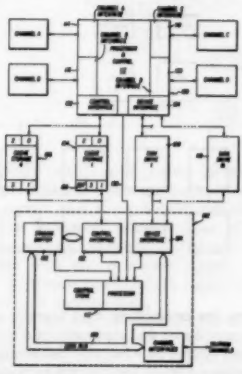
CACHE/DISK SUBSYSTEM WITH CACHE BYPASS

Merlin L. Hanson, Arden Hills; Robert E. Swenson, Mendota Heights, and Arnold R. Schmalzbauer, Minneapolis, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,091

Int. Cl.³ G06F 7/02

U.S. Cl. 364—200 7 Claims



1. In a data processing system of the type having,

a bulk memory having addressable space for storing data;

a host processor for issuing read or write commands, each

command defining an operation to be performed and specifying the starting address and the length of the bulk memory space at which said operation is to be performed;

A cache store for storing copies of segments of data which are stored in, or are to be stored in said bulk memory; and,

a storage control unit connected to said host processor, said bulk memory and said cache store and responsive to commands from said host processor for controlling the transfer of data between said host processor, said bulk memory, and said cache store,

said storage control unit being normally operative in response to any given one of said commands issued from said host processor defining a transfer of data between said host processor and said bulk memory for writing a copy of said data in said cache store,

the improvement comprising:

storage means for storing a bypass value indicative of the maximum number of segments which may be written into said cache store in response to any of said commands;

first comparing means in said storage control unit for comparing said bypass value with the length of bulk memory space specified by said given command prior to the transfer of any data between said bulk memory and said host processor;

means in said storage control unit responsive to said comparing means for inhibiting the writing of data into said cache store in response to said given command if said comparison indicates that said bypass value is less than the length of bulk memory space specified by said given command; and,

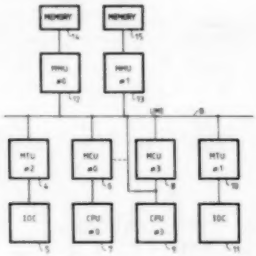
means in said storage control unit responsive to said comparing means for writing into said cache store a copy of the data specified by said given command if said comparison indicates that said bypass value is greater than the length of bulk memory space specified by said given command.

4,433,375

SYSTEM FOR SUPERPOSITION OF THE SUCCESSIVE STAGES OF THE TRANSFER OF DATA AMONG SEVERAL DATA PROCESSING UNITS

Daniel R. Vinot, Sucy en Brie, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Nov. 25, 1980, Ser. No. 210,359
Claims priority, application France, Jan. 21, 1980, 80 01213
Int. Cl.³ G06F 7/00
U.S. Cl. 364—200 **6 Claims**



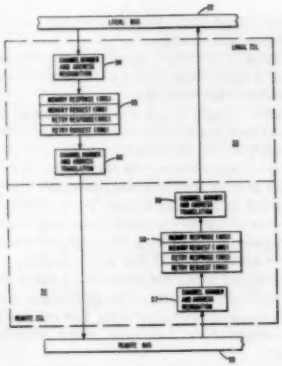
1. A system for controlling data transfer among different units such as processors and memories of a multiple processor data processing system on a bus interconnecting said units, the system comprising control logic means associated with each of said units, each of said control logic means including an identical priority circuit means responsive to a local request produced by each unit for access to the bus as well as to external requests for access to the bus transmitted as local requests by the other units, said control logic means enabling selective access to the bus of its associated unit only when the priority circuit means of said associated unit recognizes said associated unit as having a higher priority than that of other units, and said priority circuit means including a selection circuit means controlled by the local requests of all said units for selecting said requests for access to the bus by certain ones of said units depending upon the state of occupation of said bus by said units at the time of development of said local requests and respective priorities of such local requests.

4,433,376

INTERSYSTEM TRANSLATION LOGIC SYSTEM

Ralph M. Lombardo, Jr., Lowell; John J. Bradley, Framingham, both of Mass.; Kenneth E. Bruce, Nashua, N.H.; John W. Conway, Waltham, Mass.; David B. O'Keefe, Westford, Mass., and Bruce H. Tarbox, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 956,387, Oct. 31, 1978, abandoned.
This application Dec. 15, 1980, Ser. No. 216,600
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 **6 Claims**



1. A data processing network includes a plurality of data processing systems, each of said pluraliy of data processing systems includes a memory unit, a central processing unit (CPU) and a plurality of peripheral control units (PCU's) coupled in common to a system bus; also coupled to said system bus is an intersystem link unit (ISL), said ISL of a first data processing system coupled to said ISL of said second data processing system for transferring information between said first and said second data processing systems, said information being sent to said ISL of said first data processing system during a system bus cycle of said first data processing system, said information being received by said second data processing system during a system bus cycle of said second data processing system, said system bus and said ISL of said first data processing system being herein called a local system bus and a local ISL and said system bus and said ISL of said second data processing system herein called a remote system bus and a remote ISL when said first data processing system initiates the transfer of said information to said second data processing system and if required said second data processing system responds to said first data processing system, and said system bus and said ISL of said second data processing system herein called said local system bus and said local ISL and said system bus and said ISL of said first data processing system herein called said remote system bus and said remote ISL when said second data processing system initiates said information and said first data processing system responds if required, each of said ISL's having apparatus for sending and receiving said information, said apparatus comprising:

(a) register means coupled to said local bus for receiving said information and generating address file and data file signals within a bus cycle time period;

(b) memory address translation means coupled to said local bus and responsive to said information including memory address signals and a plurality of control signals received from said local bus for generating a memory hit bit signal for identifying a memory request (MRQ) or retry request (RRQ) information transfer selected by said plurality of control signals, said memory address translation means providing translated memory address signals to either address said memory units on one of said remote system busses or to provide said translated memory address to said CPU or one of said plurality of PCU's on said remote system bus for addressing of said memory units on any one of said busses;

(c) CPU destination address translation means responsive to said data file signals from said register means to provide first translated CPU address signals to address said CPU coupled to said remote bus;

(d) CPU source address translation means responsive to said data file signals from said register means and coupled to said remote bus for generating second translated CPU address signals to identify one of said CPU's coupled to one of said busses, said second translated CPU address signals being used by said remote memory unit, said remote CPU or said one of said plurality of remote PCU's on said remote bus for addressing said one of said CPU's;

(e) channel hit bit memory means coupled to said local bus and receiving said memory address signals from said local bus for generating a channel hit bit signal, said local ISL unit having means responsive to said channel hit bit signal for identifying those non-memory data processing units coupled to said remote bus to which said local ISL shall transfer said address file and data file signals; and

(f) translation control logic means responsive to said address file and data file signals of said register means in said local ISL unit and from said remote ISL unit, and responsive to said memory hit bit signal or said channel hit bit signal for controlling the operation of said memory address translation means, said register means, said CPU destination address translation means, said CPU source address translation means and said channel hit bit memory means to effect the transfer of said translated memory address signals, said first and said second translated CPU address signals, and said address file and data file signals between a unit of said data processing system coupled to said local bus and a unit of said data processing system coupled to said remote bus.

4,433,377

DATA PROCESSING WITH FORMAT VARYING

Mary S. Eustis, and Augustus W. Eustis, both of 6 Raymond St., Lexington, Mass. 02173

Filed Jun. 29, 1981, Ser. No. 278,625

Int. Cl.³ G06F 7/22

U.S. Cl. 364—200 **4 Claims**

1. In a data processing system having input means for receiving digital data to be processed and output means for displaying processed digital data an improved control unit comprising,

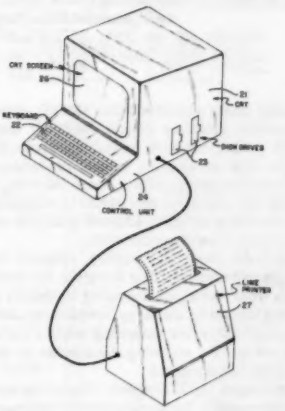
random access digital storage means comprising a linearly arranged plurality of sequential storage locations of variable length free of fixed word boundaries coupled to said input means for receiving, linearly storing and accepting operations upon, a sequence of variable length strings of digital data signals,

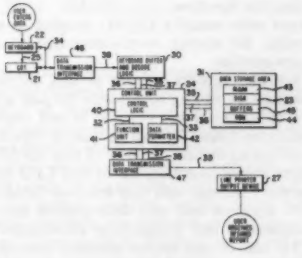
a source of data format indicators including string format indicators each including a field signal identifying the boundary location of at least one of said strings of said digital data signals in said random access digital storage means, the length thereof and at least one other attribute of said string and process format indicators each including an operation signal identifying an operation to be performed in connection with manipulating said strings of digital data signals, said string format indicators and said process format indicators,

at least one string active status register means for identifying by pointing to at least one of said string format indicators and at least one process active status register means for identifying by pointing to at least one of said process format indicators,

central processing means including control means for manipulating digital data signals and said string and process format indicators in accordance with said operation signals,

said control means coupled to said random access digital storage means, and string and processing active status register means and said source of data format indicators and responsive to said field signals and said operation signals for effecting said manipulating at least some of





which is entirely outside said control means and in said random access digital data storage means of strings of said digital data signals, said string format indicators and said process format indicators characteristics of said strings being designated by identifying ones of said field signals, in accordance with said operation signals involving at least one of arithmetic combination, logical combination, compare and data repositioning,

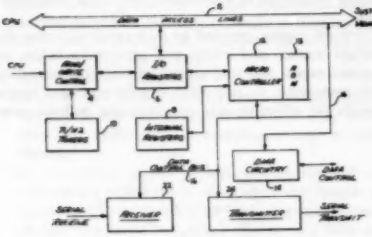
said control means also coupled to said input means and said output means and being responsive to said string format indicators and said process format indicators for controlling the entering of said strings of digital data signals from said input means to said random access digital storage means and exiting of stored digital data signals from said random access digital storage means to said output means,

and means for coupling said random access digital storage means to said output means.

4,433,378
CHIP TOPOGRAPHY FOR MOS PACKET NETWORK INTERFACE CIRCUIT

Geary L. Leger, Mentone, Calif., assignor to Western Digital, Irvine, Calif.

Filed Sep. 28, 1981, Ser. No. 306,508
Int. Cl.³ G06F 3/00, 1/00, 13/00
U.S. Cl. 364—200 4 Claims



1. A metal oxide semiconductor (MOS) chip for a micro packet network interface circuit (MPAC) implementing a preselected packet network switching protocol, for use in conjunction with an external central processing unit (CPU) having a system memory, and for communicating with external communications circuitry, said MPAC comprising:

(a) chip interface circuitry adapted to couple said MPAC to signal lines of external circuitry;

(b) read/write control circuitry coupled to said CPU through said chip interface circuitry, for receiving control signals from and control sending signals to said CPU;

(c) timing/counting circuitry coupled to said read/write control circuitry, for indicating when a certain event has occurred and for counting the number of times said certain event has occurred;

(d) input/output (I/O) registers coupled to said read/write control circuitry, for storing control information received from said CPU through said read/write control circuitry;

(e) a microcontroller coupled to said I/O registers, for regulating the functions of the MPAC;

(f) read only memory (ROM) coupled to said microcontroller, for storing microinstructions used by said microcontroller;

(g) internal registers coupled to said microcontroller, for temporarily storing information for said microcontroller;

(h) a data control bus coupled to and controlled by said microcontroller, for routing control signals and data signals among certain circuitry of said MPAC;

(i) data access lines coupled to said CPU and said system memory through said chip interface circuitry, and to said I/O registers and said data control bus, for receiving information and transmitting information between said CPU and/or said system memory, and said data control bus and/or said I/O registers;

(j) direct memory access (DMA) circuitry coupled to said data control bus, and to said system memory through said chip interface circuitry, for accessing information from said system memory through said data control bus independently of said CPU;

(k) receiver circuitry coupled to said data control bus and to a serial input from said external communications communications circuitry through said chip interface circuitry, for receiving serial data from said external circuitry, for converting said serial data into a parallel format and verifying the validity of said data, and for making said data available to said data control bus;

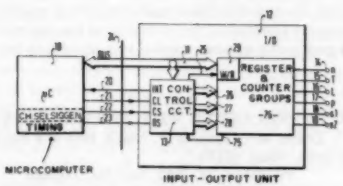
(l) transmitter circuitry coupled to said data control bus and to a serial output to said external communications circuitry through said chip interface circuitry, for accepting data in parallel format from said data control bus and appending to said data certain control and verification information, and for converting said data to a serial format and transmitting said serial data to said external communications circuitry;

wherein said interface circuitry forms a quadrilateral outer framework on said MOS chip; said ROM is disposed within one corner of said interface circuitry; said microcontroller is disposed adjacent to said ROM and along part of a first side of said interface circuitry; said DMA circuitry is disposed adjacent to said microcontroller, and within a second corner of said interface circuitry and along part of a second side thereof; said transmitter circuitry is disposed adjacent to said microcontroller and said DMA circuitry, and along part of a second side of said interface circuitry; said receiver circuitry is disposed adjacent to said transmitter circuitry, and within a third corner of said interface circuitry and along part of a third side thereof; said data access lines comprise part of said third side of said interface circuitry, and are disposed adjacent to said receiver circuitry; said timing/counting circuitry is disposed adjacent to said receiver circuitry and said data access lines and within the fourth corner of said interface circuitry; said read/write control circuitry comprises part of the fourth side of said interface circuitry, and is disposed adjacent to said receiver circuitry; said I/O registers are disposed adjacent to said timing/counting circuitry, said ROM, said microcontroller, and said read/write control circuitry; and said internal registers are disposed adjacent to said I/O registers, said ROM, and said microcontroller.

4,433,379
MICROCOMPUTER SYSTEM WITH INPUT/OUTPUT UNIT CONNECTED TO THE REMAINDER OF THE SYSTEM BY A SINGLE MULTIBIT BUS AND SEVERAL SEQUENTIAL DATA LINES

Manfred Schenk, Feilbach; Winfried Klötzner, Maulbronn, and Edmund Jeenicke, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,376
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2943903
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 11 Claims



1. A simplified computer system having a computer unit of the so-called microcomputer type and an input-output unit, connected to said computer unit over a data bus, for transferring externally determined values to said computer unit, said input-output unit having a register-and-counter portion comprising a plurality of registers and a plurality of counters, said system further comprising the improvement which consists in that, in order to avoid the use of a separate multiple-connection address bus between said computer unit and said input-output unit:

only a single multibit bus serving as said data bus, and not substantially more than four one-way signal connections, of which two are respectively for chip-select (CS) and data strobe (DS) functions, are provided to interconnect said computer unit and said input-output unit, and for contribution to the addressing of said register-and-counter portion of said input-output unit, the latter unit has a control circuit (13) connected to a part of said data bus

and also connected to said computer unit by said not more than four signal connections;

said control circuit (13) includes a decoder (40) having an input connected to said data bus port, for providing a variety of control commands and directing said commands from said data bus respectively to various registers and counters of said register-and-counter -portion by way of different outputs (41-46) of said decoder which are connected to said register-and-counter portion (76) of said input-output unit.

4,433,380

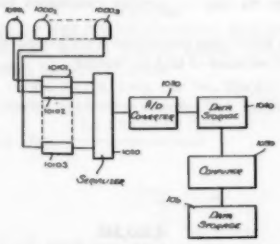
TOMOGRAPHIC SCANNER

Manlio G. Abele, Garden City, and Christopher H. Marshall, New York, both of N.Y., assignors to Philips Medical Systems, Inc., Shelton, Conn.

Continuation-in-part of Ser. No. 635,165, Nov. 25, 1975, Pat. No. 4,128,242. This application Nov. 15, 1977, Ser. No. 850,892

Int. Cl.³ G06F *15/42*

U.S. Cl. 564—414 36 Claims



1. A method of displaying X-ray attenuation data produced in a two dimensional field by a computed tomography scanner

calculating the difference between the local value of the data at a data point in the field and the average value of the data in a region of the field which surrounds said point for each point in said field, and

displaying the value of said difference as a signed gray scale value at a point in a picture which corresponds to said data point.

4,433,381

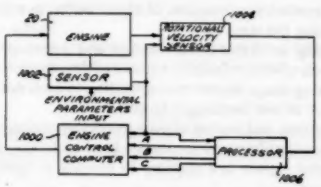
CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John R. Wilkinson, Dearborn, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 188,803, Sep. 19, 1980, Pat. No. 4,380,800. This application Jul. 23, 1982, Ser. No. 401,439

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—431.05 11 Claims



1. A control system for an internal combustion engine of the type having a movable output member which moves in response to combustion of fuel in at least one chamber in said engine, said control system comprising:

means responsive to the movement of the output member for generating an operating signal which is a function of the actual velocity and position of the output member from a predetermined position;

means for generating a reference signal which is a function of the actual velocity and position of the output member from a predetermined position;

control means responsive to said operating signal and reference signal for generating a control signal which is a function of the change of velocity of the output member with respect to position of the output member for both said operating signal and said reference signal to control an operating parameter of the engine.

4,433,382

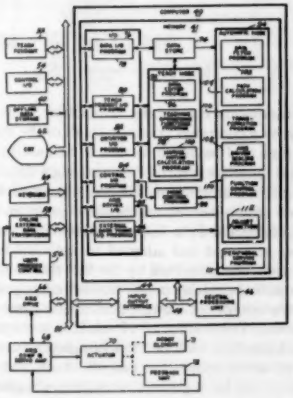
APPARATUS FOR AUTOMATICALLY ADJUSTING THE PROGRAMMED LOCATION OF A ROBOT ARM

Carole S. Cunningham; Charles M. Linser; Brian J. Resnick, and Ronald L. Tarvin, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 20, 1981, Ser. No. 285,378

Int. Cl.³ G05B *19/23*; G06F *15/46*

U.S. Cl. 364—474 8 Claims



1. An apparatus for moving a tool centerpoint of a function element to positions defining a cycle of operation, the rectangular coordinates of positions being represented by programmed sets of input signals, the apparatus being connected to a user process control, the user process control producing further sets of input signals representing rectangular coordinates of adjusted positions, the adjusted positions being defined for selected programmed positions having adjust function signals associated therewith, the apparatus comprising:

(a) a machine having machine members connected to one end of the function element and actuators associated with the machine members for providing a plurality of axes of motion to move the tool centerpoint, said plurality of axes of motion and the machine members defining a generalized coordinate system; and

(b) a machine control including a memory for storing sets of input signals, a data communication interface for exchanging sets of input signals between the user process control and the machine control and a servomechanism circuit connected to the actuators, the machine control comprising

(1) means responsive to stored input signals for controlling the actuators to move the tool centerpoint to successive programmed positions.

(2) means responsive to the tool centerpoint arriving at a programmed position and to an adjust function signal for suspending the cyclic progression through successive programmed positions,

(3) means responsive to a set of input signals received from the process control during suspension of cyclic operation for causing the actuators to move the tool centerpoint to an adjusted position, and

(4) means for resuming the cyclic progression through successive programmed positions.

4,433,383

INSTALLATION COMPRISING A PLURALITY OF NUMERICALLY CONTROLLED MACHINE TOOLS

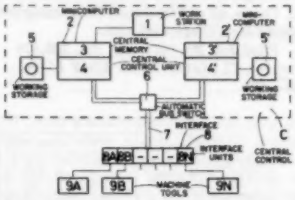
Roger Maurer, Rue du 11 Novembre, 74460 Marnaz, France

Filed Dec. 30, 1980, Ser. No. 221,216

Claims priority, application Switzerland, Dec. 27, 1979, 11456/79

Int. Cl.³ G05B *19/417*; G06F *15/46*

U.S. Cl. 364—474 **7 Claims**



1. An installation comprising N machine tools numerically controlled by a computer common to all of the machine tools, each machine tool having n motors to be monitored and controlled, said installation further comprising a data and program input station, monitor means for controlling each machine in accordance with a desired independent program and N interface units connected by at least one bus to said computer, said units being allocated and adapted to individual ones of said machines tool, characterized by the fact that said computer is a minicomputer operating in real time which together with said input station comprises a single centralized control device for simultaneously controlling all N machine tools and all n motors of each machine tool, said minicomputers being adapted to transmit all work commands and all check and state signals respectively, and having a maximum context switching time of 900 ns and a cycle time which is no more than one-fifth of the context switching time, and comprises a central memory as a working storage to store all work programs to be run, and further characterized by the fact that each interface circuit comprises n sections for checking each of the n motors of a machine tool and is a circuit of at least 2n bits, and a monitor integrated circuit connected to the output of each of said sections and assigned and adapted to each motor for all comparison and state functions controlled directly by said minicomputer, and a common identification line connecting all identification lines of said sections.

4,433,384

PATTERN DATA HANDLING SYSTEM FOR AN ELECTRON BEAM EXPOSURE SYSTEM

Donald W. Berrian, Topsfield, and Billy W. Ward, Rockport, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 5, 1981, Ser. No. 309,156

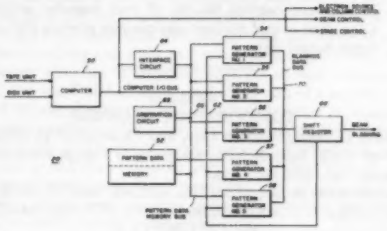
Int. Cl.³ G02B *27/00*; H01J *37/00*

U.S. Cl. 364—525 **14 Claims**

1. In an exposure system in which a beam selectively irradiates multiple abutting stripe areas of a workpiece, a pattern data handling system for providing beam blanking data comprising:

memory means operative to store figure data which describes features of a pattern to be irradiated, said figure data being subdivided into multiple blocks of segment figure data, each corresponsing to a segment of one of said stripe areas; and

processing means simultaneously operative to convert at least one of said blocks of segment figure data to a bit map containing beam blanking information for the respective



segment and to serialize beam blanking information in another bit map to provide continuous beam blanking data,

whereby figure data conversion is performed simultaneously with irradiation of said workpiece.

4,433,385

METHOD AND APPARATUS FOR REAL TIME DETECTION OF FAULTS IN INDUSTRIAL OBJECTS

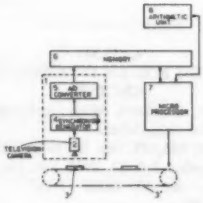
Mario M. De Gasperi, Milan; Antonio Racciu, Turin, and Dario Nari, Barge, all of Italy, assignors to Tasco S.p.A., Milan, Italy

Filed Jan. 13, 1981, Ser. No. 224,665

Claims priority, application Italy, Jan. 14, 1980, 19205 A/80

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—554 **11 Claims**



1. A method for detection of object faults, in real time, and comprising the steps of:

scanning an object to be checked and detecting luminance levels of each of a finite number of dots thereof to provide analog image signals corresponding to each dot and indicative of said luminance levels;

converting said analog signals to corresponding digital signals according to a luminance level scale and storing said digital signals in a memory to provide a digitized object image;

dividing said digitized object image into a predetermined number of areas having a predetermined number of said dots;

calculating standard deviations for digitized luminance values of the dots of each area into which the digitized object image has been divided according to the formula:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n} x_i^2}{n} - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{n^2}}$$

wherein:

x_i = luminance value of the individual dots pertaining to an area, and

n = number of dots in the area;

storing said standard deviations of said areas;

providing digitized reference standard deviation values corresponding to each of said areas;

comparing each of said standard deviations with said corresponding digitized reference standard deviation values; and

providing a fault signal when a threshold is exceeded during said comparing.

4,433,386

SURFACE RELIEF MEASURING EQUIPMENT

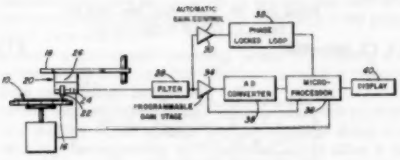
Grantley O. Este, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 8, 1980, Ser. No. 214,221

Claims priority, application Canada, Oct. 1, 1980, 361296

Int. Cl.³ G01B 7/06

U.S. Cl. 364—563 **8 Claims**



1. Apparatus for measuring the thickness of a coating comprising:

a turntable for supporting and rotating a flat substrate bearing a regularly sectored coating pattern, wherein in use, the centers of the coating pattern and the turntable are substantially coincident;

tracking means for bearing on a top surface of the patterned substrate, the tracking means vertically moveable in a direction perpendicular to the substrate;

means for moving the tracking means radially of the turntable;

a transducer operably connected to the tracking means for generating an electrical signal in response to vertical movement thereof;

a band pass filter for passing a component of the transducer electrical output at a frequency corresponding to the frequency of traversal of the pattern sectors by the tracking means;

and means for measuring amplitude of the filtered signal to provide an indication of coating thickness.

4,433,387

SYSTEM FOR PROCESSING DATA RECEIVED FROM A PORTABLE DATA STORE AND FOR CLEARING THE STORE

Robert E. Dyer, Dunwoody; Scott C. Swanson, Roswell, and Robert A. Hicks, Norcross, all of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

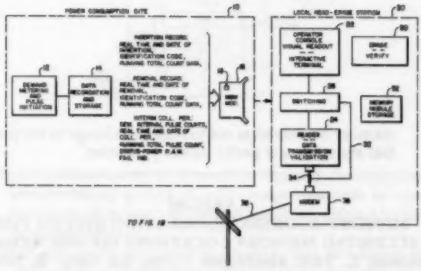
Filed Aug. 12, 1980, Ser. No. 177,334

Int. Cl.³ G06F 3/04, 13/00

U.S. Cl. 364—900 **32 Claims**

1. A system for reading data words contained in portable data storage means, said data words representative of data signals from a data source, and for treating said data signals comprising:

reader means including: a receptable for receiving said portable data storage means in signal communicating relationship, first and second signal storage means, and first signal processing means responsive to an activation command signal for transferring a first group of said data words from a predetermined location within said portable data storage means to said first signal storage means, said signal processing means being further responsive to a transmit command signal for transmitting said first group of data words stored within said first signal storage means to said second signal storage means and then to an output of said



reader means and for transferring a second group of data words from said portable data storage means to said first signal storage means while said first group of data words are being transmitted from said second signal storage means; and

translator means having an input for receiving, when activated, signals representing said transmitted data words from said output of said reader means and including second signal processor means for generating said activation command signal and said transmit command signal and for analyzing the validity of said transmitted data words and effecting the select recordation thereof upon a storage medium.

4,433,388

LONGITUDINAL PARITY

DuWayne D. Oosterbaan, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 6, 1980, Ser. No. 194,633

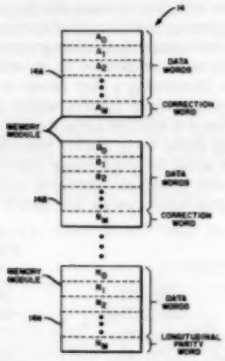
Int. Cl.³ G06F 11/00

U.S. Cl. 364—900 **9 Claims**

1. In a data processing system having a plurality of memory modules, each memory module having a plurality of memory locations for storing data bits, said data processing system having a parity memory location for storing parity bits, the improvement comprising:

a correction word memory location in each of said memory modules for storing correction word bits in each of said modules, the parity bits stored in said parity memory location being computed by logically combining said correction word bits with the data bits stored in said memory modules, so that a change in the data bits stored

in one of said memory modules can be accompanied by a change in the correction word bits stored in that one



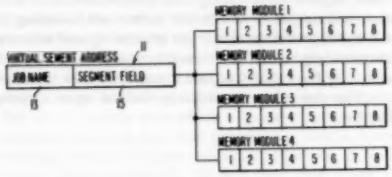
memory module so as not to require a change in the parity bits stored in said parity memory location.

4,433,389

MEMORY ADDRESS TRANSLATION SYSTEM FOR ACCESSING MEMORY LOCATIONS VIA JOB NAMES

Kenneth L. York, Huntingdon Valley, and Oscar B. Stram, Paoli, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 972,916, Dec. 26, 1978. This application Mar. 16, 1981, Ser. No. 244,152
Int. Cl.³ G06F 7/00, 7/38, 7/50
U.S. Cl. 364—900 **7 Claims**



1. A memory address translation apparatus for a data storage system having a plurality of memory modules, each memory module therein having a plurality of addressable storage locations, said data storage system addressed by a data name and an address segment, each data name and each address segment having a plurality of least significant bits and a plurality of most significant bits, said memory address translation apparatus comprising:

storage location address means including least significant bit means receiving said plurality of least significant bits of said data name and said address segment for exclusively ORing said received plurality of least significant bits of said data name with said received plurality of least significant bits of said address segment to generate at the output thereof the address of an addressable storage location in said plurality thereof; and

memory module address means including most significant bit means, permuting means and adder means;

said most significant bit means receiving said plurality of most significant bits of said data name and said address segment for exclusively ORing said received plurality of most significant bits of said data name with said received plurality of most significant bits of said address segment and for generating an output thereof;

said permuting means receiving said output of said most significant bit means and said plurality of said least significant bits of said address segment for exclusively ORing the output of said most significant bit means with said plurality of least significant bits of said address segment and for generating an output thereof; and

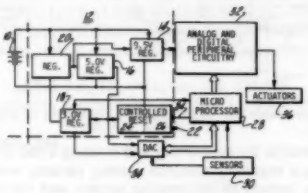
said adder means receiving said output of said permuting means and said output of said least significant bit means for adding in modulo N fashion said output of said permuting means with said output of said least significant bit means to address a memory module in said plurality thereof, said N being equal to the number of memory modules in said plurality thereof.

4,433,390

POWER PROCESSING RESET SYSTEM FOR A MICROPROCESSOR RESPONDING TO SUDDEN DEREGULATION OF A VOLTAGE

Ralph W. Carp, Newport News, and Danny O. Wright, Grafton, both of Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 30, 1981, Ser. No. 288,591
Int. Cl.³ G06F 9/00, 11/00
U.S. Cl. 364—900 **4 Claims**



1. A power processing reset system for a microprocessor responding to a sudden deregulation of a voltage, the system comprising:

a battery for providing various voltage and current levels;

at least one voltage regulated supply electrically connected to said battery and said supply operative to regulate its output voltage over a predetermined range of battery voltages;

a voltage regulator electrically connected to the battery and operative to produce a fixed output voltage that is less than said output voltage from said voltage regulated supply;

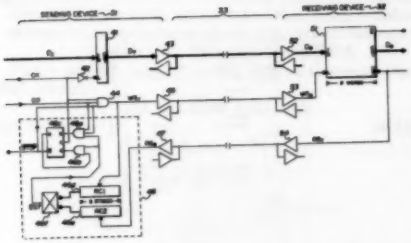
comparator amplifier means responsive to said fixed output voltage and a ratiometrically derived voltage from said one voltage regulated supply and operable to generate a control signal whenever said ratiometrically derived voltage is not equal to said fixed output voltage said control signal for controlling said one voltage regulated supply to equalize said ratiometrically derived voltage and said fixed output voltage; and

monitor means responding to said control signal to generate a minimum time based reset pulse to reset the microprocessor when said voltage regulated supply begins to fall below its regulated output when said ratiometrically derived voltage remains less than said fixed output voltage.

4,433,391
BUFFERED HANDSHAKE BUS WITH TRANSMISSION AND RESPONSE COUNTERS FOR AVOIDING RECEIVER OVERFLOW

Hanan Potash, La Jolla, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 17, 1981, Ser. No. 293,494
Int. Cl.³ G06F 3/04, 13/00
U.S. Cl. 364—900 9 Claims



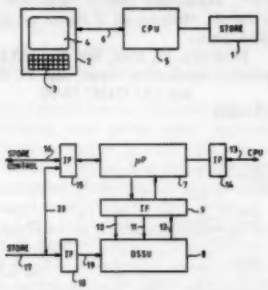
1. A digital system including:
a data bus;
a sending means coupled to said bus for transmitting words over said bus, and for generating a control signal which is not transmitted over the bus as each word is transmitted;
a receiving means, coupled to said bus at a location remote from said sending means, having a storage means with a predetermined storage capacity of greater than one word for storing said transmitted words after they have propagated over said bus;
a means, located at said receiving means, for sending a response signal over said bus whenever a word is removed from said storage means; and
a control means, located at said sending means for receiving said control signal without any propagation delay over said bus, for receiving said response signal after it has propagated over said bus, and for inhibiting said sending means from transmitting words over said bus whenever the number of received control signals minus the number of received response signals equals said predetermined storage capacity.

4,433,392
INTERACTIVE DATA RETRIEVAL APPARATUS

Paul A. Beaven, Romsey, England, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,831
Claims priority, application European Pat. Off., Dec. 19, 1980, 80304654
Int. Cl.³ G06F 11/00; G06K 9/00; G11C 7/00
U.S. Cl. 364—900 4 Claims

1. An interactive data retrieval apparatus comprising
a data store to store data records,
a keyboard to enable an operator to enter search key data and control data,
a data processor to control the storage and retrieval of data records in said data store, and
search means to compare search key data entered by the operator with data read from said store thereby to locate a data record within said data store, the search means including,
a search store for storing said entered search key data,
a data stream buffer and means for clocking successive bytes of data records forming a data stream which is read from said data store through said data stream buffer, and
comparison logic means to compare the contents of said data stream buffer within the contents of said search store and to indicate that a match has occurred
wherein the improvement comprises,
a plurality of comparison cells in said comparison logic means and means connecting the comparison cells to compare the contents of corresponding positions of said data stream buffer and said search store and to compare the contents of positions of said data stream buffer adjacent said corresponding positions with said corresponding positions of said search store, and

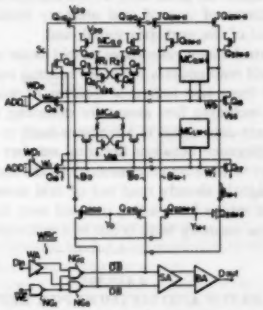


logic combination means to combine logically the outputs of predetermined groups of said comparison cells to give indictions of an exact match and matching within a predetermined distance
when said search key data is the same as said data stream or differs from said data stream but only by a predetermined amount.

4,433,393
SEMICONDUCTOR MEMORY DEVICE

Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 13, 1981, Ser. No. 310,975
Claims priority, application Japan, Oct. 15, 1980, 55-144161
Int. Cl.³ G11C 7/00
U.S. Cl. 365—203 7 Claims



1. An improved semiconductor memory device of the type including a plurality of word lines, a plurality of bit lines crossing said word lines, a plurality of memory cells disposed at the cross points between said word lines and said bit lines, and load circuits each connected between one of said bit lines and a voltage source, a memory cell disposed at the cross point of a word line and a bit line being selected by selecting said word line and said bit line, wherein the improved memory device further comprises charging circuit means, operatively connected in parallel with said load circuits, for detecting the switching period when the potentials of all the word lines are at the potential level of a non-selected condition and for elec-

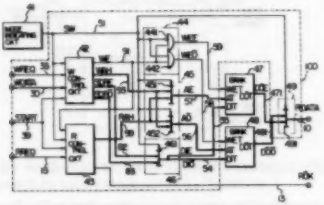
trically charging all the bit lines during the switching period of word line potentials.

4,433,394

FIRST-IN FIRST-OUT STORAGE AND PROCESSING UNIT MAKING USE THEREOF

Shunichi Torii, Musashino; Shigeo Nagashima, Hachioji, and Koichiro Omoda, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,186
Claims priority, application Japan, Sep. 19, 1980, 55-129326
Int. Cl.³ G11C *19/00*
U.S. Cl. 365—221 **15 Claims**



1. A first-in first-out memory comprising:

a plurality of memory banks each capable of read and write modes of operation;

first indicating means for generating a mode indicating signal sequentially and cyclically indicating a write mode of operation for said memory banks in a predetermined order in response to a clock signal;

write control means responsive to said mode indicating signal and sequentially received data signals for writing said sequentially received data signals into different ones of said memory banks according to said predetermined order and at the sequential timings when said write mode is indicated for said different memory banks;

second indicating means responsive to an applied read request signal for generating a read address signal indicating an address of one of said memory banks for effecting readout of the next data signal; and

read control means responsive to said mode indicating signal and said read address signal for reading out said next data signal from said indicated address of said one memory bank, including first means for detecting the presence of said next data signal in a memory bank in dependence on the difference between the total number of data signals already written into the memory banks and the number of data signals already read out of said memory banks and second means for reading out said next data signal when said one memory bank is not in a write mode.

4,433,395

APPARATUS AND METHOD FOR REFRESHING NON-VOLATILE MEMORY

Sadahiro Iyehara, Suita; Kazumi Kawashima; Minoru Ueda, both of Takatsuki; Keisuke Yamamoto; Tatsuhiro Hosokawa, both of Ibaraki, and Yukio Furuta, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 27, 1981, Ser. No. 257,618
Claims priority, application Japan, May 6, 1980, 55-60156
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—222 **12 Claims**

1. An apparatus for refreshing a non-volatile memory having a plural number of addresses comprising:

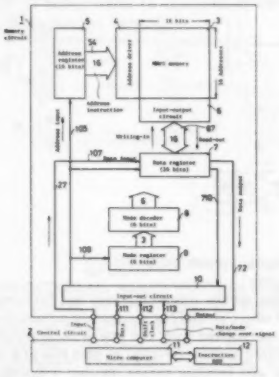
(a) a data register connected to an input-output circuit of said non-volatile memory;

(b) an address register connected to an address driver of said non-volatile memory;

(c) an input circuit connected to said data register and said address register;

(d) a control circuit means including a microcomputer and an instruction ROM;

(e) a non-volatile refreshing buffer memory for, in the refreshing operation of said non-volatile memory, temporarily storing the contents of an address selected sequentially from said non-volatile memory; and



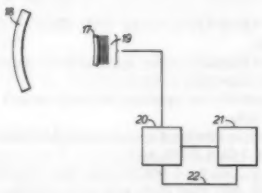
(f) said control circuit means including means for issuing control signals for reading a data signal out from a selected address of said non-volatile memory, writing said read out data into said non-volatile refreshing buffer memory, reading out said data signal from said non-volatile refreshing buffer memory, and writing said read out data signal again into said selected address from which the data signal was read out.

4,433,396

SONAR RECEIVERS

Phillip L. M. Johnson, and John R. Walden, both of Somerset, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 8, 1981, Ser. No. 300,128
Claims priority, application United Kingdom, Sep. 10, 1980, 8029193
Int. Cl.³ G01S *7/54, 15/42*
U.S. Cl. 367—105 **16 Claims**



1. A sonar receiver, comprising an inwardly curved reflector arranged to direct received sonar signals onto a transducer system, which transducer system comprises an array of transducers distributed over an inwardly curved path facing the reflector such that each transducer is directed towards the center of the reflector and is responsive to sonar signals received from a particular direction to provide an output signal, indicative of a reflecting object, the amplitude of which signal is related to distance of the reflecting object.

2. A sonar receiver as claimed in claim **1**, including sequen-

tial selection means arranged to couple the outputs of the transducers sequentially to a display device for indicating, in response to a signal, the direction and distance of a reflecting object.

4,433,397

CIRCUIT ARRANGEMENT FOR THE FORMATION AND PROCESSING OF GROUP SIGNALS

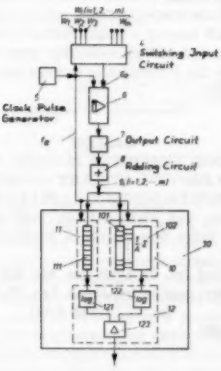
Egidius Arens, Achim, and Ravin Patel, Achim-Bierden, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,885

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048240

Int. Cl.³ G01S *3/80, 3/00*

U.S. Cl. 367—122 **10 Claims**



1. In a circuit arrangement for forming a succession of group signals in the ranging art for a momentarily effective characteristic of a group of adjacent group characteristics obtained from received signals originating from a number n of adjacently aligned transducers from a larger plurality of m transducers in a signal receiving system, the group signals being formed by varied, quantized time delays determined by the geometric arrangement of the plurality of m transducers in the signal receiving system and by the propagation speed of impinging signals in the transmission medium, the circuit arrangement including:

input circuit means coupled to the plurality of m transducers for the repeated, consecutive interrogation of each individual transducer in succession to derive correspondingly successive received signal values, the input circuit means having a single output for providing representations of the received signal values in the order in which they are derived;

memory circuit means having one read-in point coupled to the single output of the input circuit means, the memory circuit means being provided with a plurality of memory locations which are sequentially removed from the read-in point and each of which is capable of storing one received signal value representation, the number of memory locations being at least determined by the maximum time delay which must be imparted to the first interrogated received signal value, for storing each signal value representation appearing at the output of the input circuit means in succession so that each such representation, after read-in to the memory circuit means, consecutively occupies in steps the memory locations which are further removed from the read-in point;

output circuit means coupled to the memory circuit means for the non-destructive read-out of stored representations of interrogated signal values which were received from a number n of adjacent transducers, from those of the memory locations which correspond to required time delays with respect to the read-in point; and

adding circuit means coupled to the output circuit means and responsive to signals therefrom, and having an output at which appears successive group signals for a corresponding succession of adjacent group characteristics, the improvement wherein said circuit arrangement further comprises:

integrating circuit means connected to the output of said adding circuit means for forming a representation of the mean value of a predetermined number of successive group signals;

time delay means connected to the output of said adding circuit means for delaying each group signal appearing at said adding circuit means output by a selected time which is no greater than the time interval over which the predetermined number of successive group signals appear at said adding circuit means output; and

ratio forming means having inputs connected to receive each representation formed by said integrating circuit means and each delayed signal from said time delay means and having an output at which appears a representation of the signal to noise ratio of each successive group signal appearing at the output of said adding circuit means.

4,433,398

ULTRASONIC TRANSDUCER

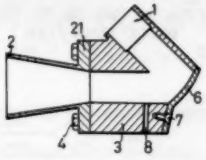
Masao Kodera, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1981, Ser. No. 265,692

Claims priority, application Japan, Aug. 25, 1980, 55-120380[U]

Int. Cl.³ H04R *1/34*

U.S. Cl. 367—140 **4 Claims**



1. An ultrasonic transducer comprising:

an ultrasonic vibrator having a cylindrical body for transmitting and receiving ultrasonic waves;

a cylindrical horn for imparting directivity to said ultrasonic waves;

a cylindrical wave guide connecting said vibrator and said horn, said guide being bent so that said vibrator is positioned above said horn;

a reflecting plate having a paraboloidal reflecting surface exposed within the bent portion of said guide for reflecting said ultrasonic waves passing therethrough;

one end of said wave guide being coaxially connected to said horn and the other end to said vibrator;

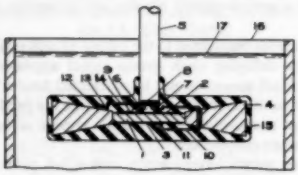
the central axis of said wave guide coaxially aligned with said vibrator intersecting the central axis of said guide coaxially aligned with said horn on said paraboloidal reflecting surface; and

said vibrator being positioned at the focal point of said paraboloidal reflecting surface.

4,433,399
ULTRASONIC TRANSDUCERS

Frank Massa, Cohasset, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees

Continuation-in-part of Ser. No. 54,812, Jul. 5, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 315,640
Int. Cl.³ H04R 17/00
U.S. Cl. 367—157 10 Claims

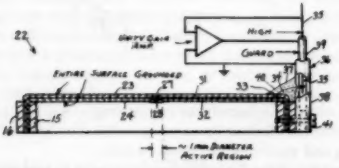


1. In combination in an electroacoustic transducer adapted for generating sound in a liquid, a vibratile transducer element having a circular peripheral vibratile surface, an acoustic transmission line comprising a metallic washer-shaped structure with a center circular opening and characterized in that the radial dimension of said washer-shaped transmission line is greater than the thickness dimension of said transmission line, means for bonding said circular peripheral vibratile surface of said transducer element to the periphery of the circular opening in said acoustic transmission line, electrical terminal means connected to said transducer element for receiving alternating current electrical signals to operate said transducer element and a sound conducting rubber-like waterproof housing molded or potted to completely enclose said vibratile transducer element and said transmission line.

4,433,400
ACOUSTICALLY TRANSPARENT HYDROPHONE PROBE

Aime' S. DeReggi, Boys, and Gerald R. Harris, Rockville, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Nov. 24, 1980, Ser. No. 210,044
Int. Cl.³ H04R 17/00
U.S. Cl. 367—163 8 Claims

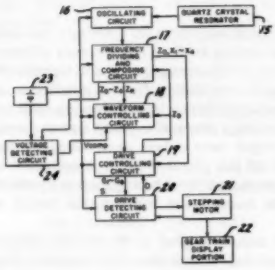


1. A hydrophone device comprising supporting hoop means of a selected area, sheet means of biaxially oriented polymer material secured in said hoop means and held thereby in a taut condition, said polymer sheet means having a poled piezoelectric area of predetermined size, the selected area of said sheet means defined by said hoop means being larger than the size of said poled piezoelectric area, and said poled piezoelectric area being located in said sheet means in spaced relation to said hoop means such that said hoop means during use remains outside the region of the medium subjected to the acoustic energy and the point being probed by said hydrophone device, said sheet means having respective electrode means of deposited metal on opposite sides of said poled piezoelectric area, said sheet means having a thickness selected such that it is substantially acoustically transparent in liquid, and respective electrical leads of deposited metal on said sheet means, connected to said electrode means and extending toward the periphery of said sheet means, said deposited electrode means and electrical leads comprising metal films having thicknesses selected such that the electrode means and electrical leads do not affect the acoustical transparency of said sheet means, wherein said sheet means comprises two identical polymer membranes bonded together defining respective piezoelectric laminae and being provided with abutting deposited electrodes about 1 mm in diameter and with opposite outer metallized ground plane coatings, with a plurality of said poled piezoelectric areas therebetween, wherein said electrical leads include respective superimposed strips of deposited metal between the two membranes, connected to the electrodes and having a common connection junction near the perimeters of the membranes, a transmission line secured to said hoop means, said transmission line having an outer conductor sleeve and a center conductor, means connecting said common connection junction to said center conductor, and means connecting said outer ground plane coatings to said outer conductor sleeve, the membranes each having a poled piezoelectric area adjacent said electrodes, and said piezoelectric areas being oppositely poled, whereby the piezoelectric laminae are electrically connected in parallel.

4,433,401
ELECTRONIC TIMEPIECE HAVING A STEPPING MOTOR AND DRIVING CIRCUIT COMPENSATED FOR POWER SOURCE VARIATIONS

Masaharu Shida, and Makoto Ueda, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,319
Claims priority, application Japan, Sep. 18, 1979, 54-119799
Int. Cl.³ G04B 9/00
U.S. Cl. 368—204 11 Claims



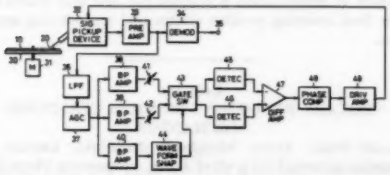
1. An electronic timepiece, comprising:
a stepping motor having a rotor;
a rotation detection circuit for detecting rotation and non-rotation conditions of said rotor and for developing an output signal indicative of the condition of said rotor;
a power source;
a voltage detecting circuit for detecting the output voltage of said power source and for developing an output signal indicative of the detected output voltage of said power source; and
driving control circuit means for generating a pulse driving signal each pulse of which comprises a plurality of subpulses and for applying the pulse driving signal to drive said stepping motor, said driving control circuit means comprising means responsive to the output signal of said voltage detecting circuit for determining the effective pulse width of each pulse of said pulse driving signal according to the detected output voltage of said power source, and correction pulse generating means responsive to the output signal of said rotation detection circuit for

applying a correction pulse to drive said stepping motor when non-rotation of said rotor is detected by said rotation detection circuit after the application of a driving pulse to said stepping motor.

4,433,402
REFERENCE SIGNAL DETECTION CIRCUIT IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Isami Kaneda, Yokohama; Susumu Sakakibara, Sagamihara, and Yasushi Sano, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 13, 1981, Ser. No. 310,767
Claims priority, application Japan, Oct. 13, 1980, 55-142748
Int. Cl.³ G11B *21/10*
U.S. Cl. 369—43 **4 Claims**



1. A reference signal detection circuit in a rotary recording medium reproducing apparatus having a reproducing transducer for reproducing an information signal recorded on a rotary recording medium and reference signals for a tracking servo system, said reference signal being recorded in a form of a tone burst, said transducer reproducing said signals from said rotary recording medium rotating at a predetermined rotational speed, and tracking servo loop means responsive to said tracking servo reference signals picked up from said recording medium for performing a tracking servo operation according to the tracking servo signal, said tracking servo loop means having a gain cross-over frequency, where the open-loop gain becomes zero, said detection circuit constituting a part of said track servo loop means and comprising a single rectifying and smoothing circuit means responsive to said transducer for rectifying and smoothing said reproduced reference signals obtained in the form of tone burst,

said rectifying and smoothing circuit means having a low-pass filter characteristic with a cutoff frequency which is within a frequency range between substantially one-third and twice said gain cross-over frequency in the gain characteristic of said tracking servo loop means, and

means responsive to said rectifying and smoothing circuit means for producing an output which is indicative of an amplitude of the tracking servo signal.

4,433,403
OPTICAL DISC RECORDING AND RETRIEVAL SYSTEM

Sueki Baba, Osaka; Tomio Yoshida, Katano; Nobuo Akahira, Yawata, and Tadaoki Yamashita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 15, 1981, Ser. No. 254,274
Claims priority, application Japan, Apr. 15, 1980, 55-49717
Int. Cl.³ G11B *27/22, 27/30*
U.S. Cl. 369—48 **5 Claims**

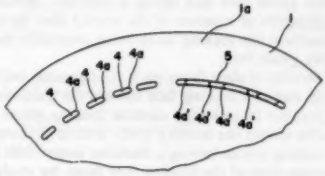
1. A signal recording and retrieval system comprising:

a means for recording a primary signal on a recording track provided on a recording medium by projecting thereonto a laser beam which has been modulated by said primary signal;

a means for further recording a secondary signal, by superposition, onto a section of said recording track having a previously recorded primary signal which is to be deleted, by projecting said laser beam thereonto, said laser beam being modulated by said secondary signal and said secondary signal having a frequency band which is different from a frequency band of said primary signal;

a means for retrieving a signal including said primary signal from said recording track;

a means for extracting said secondary signal from said retrieved signal during the retrieval thereof;

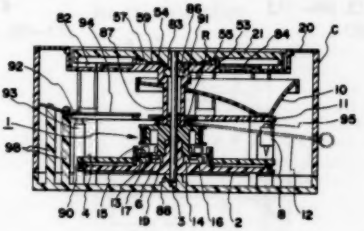


and a means for inhibiting an outputting of said retrieved primary signal by controlling a gate means provided in a transmission path of said retrieval signal during these periods of time when a separated secondary signal is present in said retrieved signal.

4,433,404
VARIETY PLAYING SOUND REPRODUCING DEVICE

Katsumi Watanabe, Kawasaki, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Oct. 1, 1981, Ser. No. 307,534
Claims priority, application Japan, Jul. 24, 1981, 56-116142
Int. Cl.³ G11B *3/00, 17/00*
U.S. Cl. 369—66 **6 Claims**



1. An improved sound reproducing device comprising:

a casing;

a center shaft mounted within the casing;

a turn table fixedly attached to the center shaft;

a record disc mounted on the turn table and having a plurality of recorded grooves, each having a start and an end point of sound reproduction;

a constant torque spring motor for driving the turn table;

a tone arm mounted within the casing;

a pickup carried by the tone arm, the pickup being positioned above the record disc;

return spring means mounted within the casing for biasing the pickup toward the start point of sound reproduction on the record disc;

a sound transmitting member disposed within the casing;

a speaker connected to the sound transmitting member, the sound transmitting member being interposed between the tone arm and the speaker;

a pull string for winding the constant spring torque motor, the pull string releasing engagement of the pickup with the record disc when the string is stretched straight under tension to allow the pickup to return to the start point of sound reproduction on the record disc;

the constant torque spring motor and turntable each having a face that coaxially confronts the face of the other,

a one-way clutch interposed between the turn table and the constant torque spring motor for driving the turn table in a direction of sound reproduction of the record disc, the one-way clutch comprising:

a guide face on one of the confronting faces surrounding the center shaft and defining a holding space therearound;

a plurality of locking faces projecting radially inward from the guide face and facing a direction opposite from the direction of rotation of the record disc for sound reproduction, the locking faces being unequally spaced around the guide face;

a plurality of slant faces, each continuously inclining from a tip end of a locking face toward the guide face;

a plurality of generally circular locking pieces freely movable within the holding space around the center shaft, the locking pieces having a diameter larger than the extent of protection of the locking face from the guide face; and

a plurality of locking projections extending radially about the center shaft, the locking projections being disposed on the other of the two co-axially confronting faces of the constant torque spring motor and the turn table.

4,433,405

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A MECHANISM FOR CONNECTING A LID MEMBER TO A JACKET

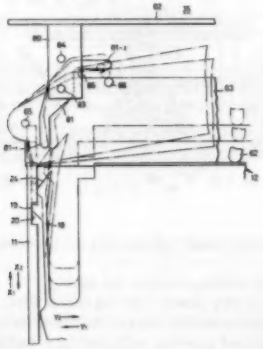
Takashi Saito, Ayase, and Masafumi Mochizuki, Yamato, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 20, 1981, Ser. No. 294,802

Claims priority, application Japan, Aug. 20, 1980, 55-117740[U]

Int. Cl.³ G11B *5/82, 25/04*

U.S. Cl. 369—77.2 **6 Claims**



1. A reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket having a space for accommodating said rotary recording medium and an opening for enabling said rotary recording medium to go into and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said lid member having engaging arms for engaging said jacket, said rotary recording medium reproducing apparatus comprising:

means for defining an inserting opening in said apparatus through which said case is inserted;

lid member locking means located at an innermost part of said reproducing apparatus, for locking said lid member to said lid member locking means when said case is inserted into a final inserting position within said reproducing apparatus, and for releasing the locking with respect to said lid member when an empty jacket is inserted into the final inserting position within said reproducing apparatus; and

a lid member-jacket disconnecting mechanism comprising disengaging members for deforming said engaging arms from an original state and releasing an engagement of said engaging arms with said jacket to disconnect said lid member from said jacket when said case is inserted into the final inserting position within said reproducing apparatus and then pulled from said reproducing apparatus, said disengaging members maintaining said engaging arms in a deformed state when said jacket is pulled from said reproducing apparatus so that said lid member is locked by said lid member locking means and kept within said reproducing apparatus, and a mechanism for operating said disengaging members so as to release said engaging arms from the deformed state and enable said engaging arms to resiliently return to the original state and engage said jacket, to thereby connect said lid member with said jacket, in response to an operation in which an empty jacket is inserted into and then pulled from the final inserting position within said reproducing apparatus.

4,433,406

ROTARY RECORDING MEDIUM CLAMPING MECHANISM

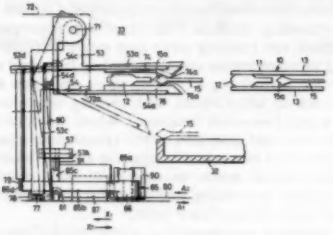
Takashi Saito, Ayase; Masafumi Mochizuki, Yamato, and Norimasa Arai, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 26, 1981, Ser. No. 296,496

Claims priority, application Japan, Aug. 26, 1980, 55-117335

Int. Cl.³ G11B *17/04*

U.S. Cl. 369—77.2 **7 Claims**



7. A rotary recording medium reproducng apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for enabling said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening in said apparatus through which said case is inserted;

a rotary recording medium clamping mechanism in an innermost part of said reproducing apparatus, for clamping an outer peripheral groove guard of said rotary recording medium when said cast is inserted into said reproducing apparatus and then said jacket is pulled from said reproducing apparatus; and

turntable means for rotating said rotary recording medium clamped and left inside said reproducing apparatus,

said rotary recording medium clamping mechanism comprising a rotatable lower clamp member, a mechanism for holding said lower clamp member in a substantially horizontal position upon clamping, an upper clamp member rotatable to oppose said lower clamp member and having projection means projecting downwardly at a tip end thereof, and a mechanism for locking said upper clamp member, after said outer peripheral groove guard of said rotary recording

medium enters between said upper and lower clamp members, when said projection faces the inner side of said outer peripheral groove guard,

said locking mechanism comprising a lock lever undergoing a rotation interrelatedly with a case insertion into said reproducing apparatus, and a mechanism for holding said lock lever, when said case is inserted to the innermost position, at a position where said lock lever has rotated at this time instant, said lock lever, at a rotational position held by said holding mechanism, engaging a part of said upper clamp member to lock the same so that said projection does not move upwards.

4,433,407

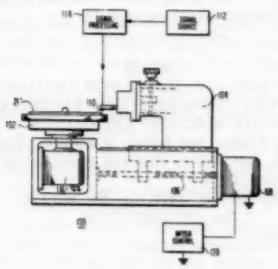
METHOD AND APPARATUS FOR RECORDING VIDEO SIGNALS INTO A METAL SUBSTRATE

George H. N. Riddle, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,388

Int. Cl.³ G11B *3/00*

U.S. Cl. 369—127 16 Claims



1. Apparatus for recording information signals along a spiral information track in a disc-shaped substrate, comprising:

a turntable adapted for rotating said disc-shaped substrate;

means for cutting a depression in a surface of said disc-shaped substrate;

means for establishing relative motion between said cutting means and said disc-shaped substrate such that said cutting means cuts a depression in the form of a spiral path in said surface of said disc-shaped substrate; wherein when said relative motion establishing means cuts said depression in the form of a spiral path having a constant pitch a ridge is formed on a cutting edge of said means cutting which deleteriously affects the previously cut information; and

means for varying said relative motion means such that said spiral path is formed having a pitch that varies to affect a dimension of said depression such that said depression varies continuously across said surface of said disc-shaped substrate to reduce said ridge on said cutting edge;

said depression being cut in a contiguous spiral path in said surface such that no land areas separate adjacent convolution of said spiral path.

4,433,408

CANTILEVER FOR PICKUP CARTRIDGE

Koichi Azuma; Masahiro Nagasawa; Hiroshi Yamazoe, and Masaki Aoki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 116,837, Jan. 30, 1980, abandoned, which is a division of Ser. No. 941,908, Sep. 13, 1978, Pat. No. 4,212,838. This application Mar. 9, 1982, Ser. No. 356,268

Claims priority, application Japan, Sep. 20, 1977, 52-113520; Sep. 20, 1977, 52-113521

Int. Cl.³ G11B *3/02, 3/46*

U.S. Cl. 369—170 8 Claims

1. A cantilever for a pickup cartridge comprising an elongated cylindrical base and a layer of boron or boride deposited around said base by low pressure chemical vapor deposition, said layer exhibiting a high specific modulus of elasticity ratio higher than 5,000 Kg/mm^2.

4,433,409

PICK-UP ASSEMBLY FOR VIDEO DISC PLAYER

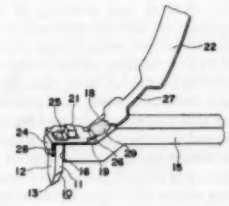
Mahito Tsuji, Yawata; Toshiyuki Kudo, Hirakata, and Kazuo Itoh, Matsubara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 11, 1982, Ser. No. 357,322

Claims priority, application Japan, Mar. 13, 1981, 56-35884[U]

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—170 5 Claims



1. A pick-up assembly which comprises, in combination:

a generally square cross-sectional elongated stylus having first and second planar surfaces disposed opposite to and generally parallel to each other, and having an electrode provided on said first planar surface of said stylus so as to extend lengthwise thereof;

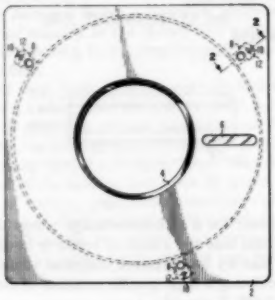
a generally elongated stylus carrier having first and second support faces formed at one end thereof so as to lie at right angles to each other, said stylus having said second planar surface and one adjacent surface secured to said first and second support faces so as to position said first planar surface of said stylus to face in a direction away from said carrier, said stylus so secured extending generally transversely of the longitudinal axis of the carrier; and

a generally strip-shaped resilient fly lead having one end bent to protrude generally perpendicular to the remaining portion thereof so as to form a lateral plane surface parallel to said first planar surface of said stylus, said bent end being physically and electrically connected to said electrode.

4,433,410
PROTECTIVE CARTRIDGE FOR OPTICAL DISCS

Bohdan W. Siryj, Cinnaminson, and Angelo G. Lazzery, Oaklyn, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,605
Int. Cl.³ G11B *17/04, 23/02;* **B65D** *85/57*
U.S. Cl. 369—291 **10 Claims**



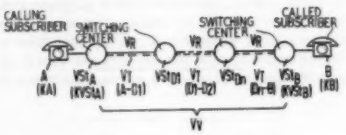
1. A record package comprising:
a disc record;
an enclosure for protecting an information bearing surface of said disc record, said enclosure having a cavity for housing said disc record, said enclosure having a plurality of apertures of a predetermined shape formed therethrough; and
a plurality of holding means, coupled to said enclosure, for holding said disc record such that said disc record is suspended in said cavity and said information bearing surface is spaced from a side surface of said enclosure, each of said plurality of holding means being slidably positioned in said enclosure and biased to engage the outside rim of said record disc to suspend said record disc in said cavity, each of said plurality of holding means having an aperture of said predetermined shape formed therethrough, respective ones of said plurality of apertures formed in said holding means being offset with respect to respective ones of said plurality of apertures formed in said enclosure when said plurality of holding means engage said outside rim of said record disc;
pin means, arranged on means for utilizing said record package, said pin means engaging said record package such that respective ones of said plurality of apertures formed in said holding means are aligned with respect to respective ones of said plurality of apertures formed in said enclosure, said pin means disengaging said holding means from said outside rim of said record disc for sliding said plurality of holding means to disengage said record disc to permit said disc record to rotate within said cavity.

4,433,411
TELEPHONE SWITCHING NETWORK FOR DIGITAL SPEECH TRANSMISSION

Stanislaus Gefroerer, Taufkirchen, and Werner Vollmeyer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,642
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036649
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—80 **21 Claims**

1. A telephone switching network for digital speech transmission, comprising:
a plurality of switching centers capable of being connected in tandem between an originating subscriber terminal and a destination subscriber terminal;
means in each of said switching centers for receiving dialing information and establishing virtual connections between the originating and destination switching centers connected to the originating and destination subscribers;
means for subdividing the speech into speech phrases;
means in each switching center for assigning real connections between two switching centers only for transmission of a respective speech phrase;
means for transmitting a speech phrase in the form of a digital information section in real time over the real connection including a destination identifier indicating the virtual partial connections to be traversed, the digitized speech phrase and an end identifier indicating the end of the digitized speech phrase;

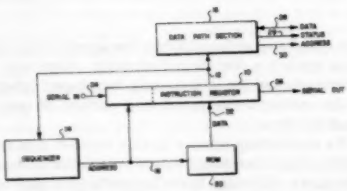


means for releasing the established real connection after termination of transmission of an information section;
means for disconnecting the virtual connection upon termination of a call;
means for subdividing said digital speech phrases, by rastering, into predetermined intervals or time slots corresponding to 64 octets, each phrase corresponding to an arbitrary number of successive time slots; and
means in said switching centers for suppressing integer time slots of a phrase when no real connection is available and transmitting in real time the remainder of the phrase at the beginning of a new unsuppressed time slot in response to a real connection becoming available.

4,433,412
METHOD AND APPARATUS FOR TESTING AND VERIFYING THE OPERABILITY OF REGISTER BASED STATE MACHINE APPARATUS

David W. Best, Marion, and Jeffrey D. Russell, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1981, Ser. No. 264,179
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—25 **6 Claims**



1. State machine test apparatus comprising, in combination:
instruction register means including an address section and a data path section;
read only memory (ROM) means, connected to said register means for supplying addressed words thereto in response to receipt of appropriate input address signals;
sequencer means connected between said register means and said ROM means for supplying said input address signals to both said ROM means and to said address section of said register means in response to receipt of appropriate control signals from said register means;
test signal supply means, connected to said register means, for supplying predetermined instructions to said register

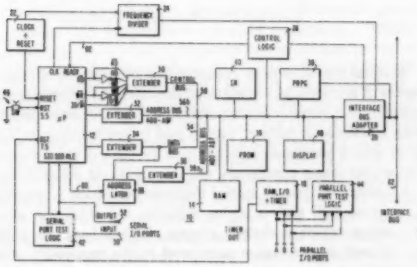
means whereby addressed words are returned to said register means from said ROM means; and

test signal apparatus output means for outputting from said register means both the addressed word returned by said ROM means in response to a predetermined instruction as supplied by said test signal supply means and the address last stored in said register means from said sequencer means, whereby the outputted word can be compared to a predetermined desired response.

4,433,413
BUILT-IN APPARATUS AND METHOD FOR TESTING A MICROPROCESSOR SYSTEM

Patrick P. Fasang, Mount Laurel, N.J., assignor to Siemens Corporation, Iselin, N.J.

Filed Oct. 22, 1981, Ser. No. 314,044
Int. Cl.³ G06F *11/00*; G01R *31/28*
U.S. Cl. 371—25 **10 Claims**



1. Apparatus built into a computer system having a microprocessor, said apparatus being adapted for testing the overall functional operation of the system and comprising, in combination:

memory means, electrically connected to the microprocesor, for storing a sequence of test instructions to be executed by the microprocessor;

data source means, electrically connected to the microprocessor, for providing test input data to be acted upon by the microprocessor when the microprocessor is under control of the test instructions;

signature register means, electrically connected to the microprocessor, for acquiring test output data resulting from the functional operation of the microprocessor acting upon said test input data when the microprocessor is under control of the specified test instructions, said signature register producing actual test signatures from said test output data;

comparator means, connected to receive said actual test signatures, for determining the coincidence or non-coincidence of said actual test signatures with corresponding predicted test signatures representative, respectively, of the test output data that would have been produced if the functional operation of the system were error-free; and

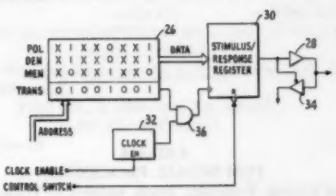
means, connected to said comparator means, for communicating to outside the system the coincidence or non-coincidence determined by said comparator means.

4,433,414
DIGITAL TESTER LOCAL MEMORY DATA STORAGE SYSTEM

Maurice E. Carey, Troy, N.Y., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sep. 30, 1981, Ser. No. 307,322
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—27 **13 Claims**

1. In a digital tester for testing electronic components, having a data channel that is operatively connected to the electronic component including an associated local memory having at least as many address locations as there are cycles in a testing procedure with a different location being addressed during each cycle in a testing procedure, a method of loading the local memory with digital information relating to the operation to be performed in the data channel during a test, comprising the steps of:



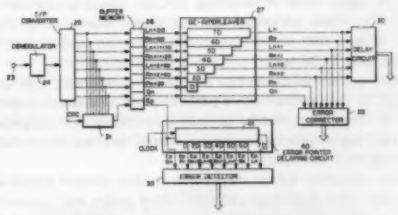
loading vectors describing transitions to be made in the operation to be performed in the data channel only at the address locations of the local memory that correspond to the test cycles in which said transitions are to take place; and

loading into each address location of the local memory data that is indicative of whether the vector information stored in the address location is valid transition data.

4,433,415
PCM SIGNAL PROCESSOR

Tadashi Kojima, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 10, 1981, Ser. No. 300,737
Claims priority, application Japan, Sep. 16, 1980, 55-128332
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **6 Claims**



1. A pulse code modulation (PCM) signal processor for extracting data words from a serial PCM data block also containing an error detection and correction code, said signal processor comprising:

serial-to-parallel converter means for converting said serial PCM data block into a parallel format, said serial-to-parallel converting means having terminals each outputting in parallel a different one of said data words and said error detection and correction code;

de-interleave means conneected to said terminals of said serial-to-parallel converter means for adding different delays to said data words such that all of said data words appear synchronously at the output of said de-interleave means;

means connected to said terminals of said serial-to-parallel converter means for forming an error pointer from said data words and said error detection and correction code, said error pointer comprising data word error pointers each indicating the presence of an error in a different one of said data words;

an error pointer shift register connected to said error pointer forming means for synchronizing said error pointer with

said de-interleave means such that each data word error pointer is synchronized with its corresponding data word; and

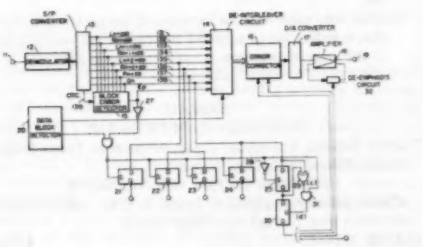
means connected to said error pointer shift register and to said de-interleave means for detecting and correcting errors in said data words from said de-interleave means using said data word error pointers from said error pointer shift register.

4,433,416

PCM SIGNAL PROCESSOR

Tadashi Kojima, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 10, 1981, Ser. No. 300,738
Claims priority, application Japan, Sep. 16, 1980, 55-128331
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **4 Claims**



1. A pulse code modulation (PCM) signal processor for extracting signal processor control words from a serial PCM data stream also containing error detection and correction words, said PCM signal processor comprising:

serial-to-parallel converter means for converting said serial PCM data stream into a parallel form, said serial-to-parallel converter means including terminals for outputting said signal processor control words and said error detection and correction words;

error detecting means responsive to said control words and said error detection and correction codes and connected to said serial-to-parallel converter means terminals for forming an error signal having a first state indicating the presence of an error in said control words and a second state indicating the absence of an error in said control words;

first means coupled to said serial-to-parallel converter means for storing first signal processor control signals from said signal processor control words when said error signal is in said second state and for preventing the storage of said first signal processor control signals when said error signal is in said first state; and

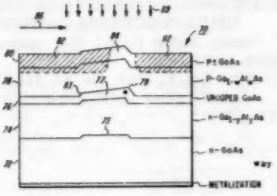
second means connected to said serial-to-parallel converter means for storing second signal processor control signals from said signal processor control words when said error signal is initially in said first state and subsequently in said second state and when said second signal processor control signals from signal processor control words of two successive PCM data streams are equivalent, said second storing means thereby reducing the chance of erroneous operation by the receipt of random errors in PCM control signals by ensuring that second signal processor control signals be the same in two successive PCM data streams before storage of said signals.

4,433,417

NONPLANAR SUBSTRATE INJECTION LASERS GROWN IN VAPOR PHASE EPITAXY

Robert D. Burnham, Palo Alto; Donald R. Scifres, Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1981, Ser. No. 268,596
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **21 Claims**



1. In an injection laser comprising a plurality of contiguous layers of semiconductor material deposited by chemical phase epitaxy on a semiconductor substrate, said substrate provided with a nonplanar pattern, one of said layers forming an active layer with a nonplanar active region for optical wave propagation under lasing conditions, the improvement comprising

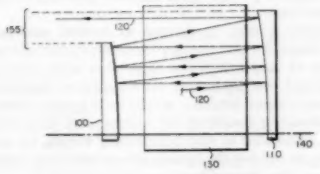
a continuous lateral spatial thickness variation transversely across said active region wherein the thickness of said active region is slightly greater along at least one portion of said active region compared to the remainder of said active region, said variation to provide an effective lateral refractive index variation within said active region thereby permitting the maintenance of the lowest order transverse mode along the plane of said active region about said one portion of said active region.

4,433,418

OFF-AXIS ASTIGMATIC UNSTABLE LASER RESONATOR

Irl W. Smith, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 6, 1981, Ser. No. 232,085
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—95 **11 Claims**



1. In combination:

a gain medium;

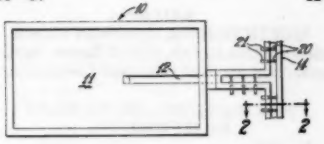
means, including a resonant cavity and having disposed in such cavity the gain medium, for urging electromagnetic waves in said cavity and passing through the gain medium outwardly in a predetermined direction towards a predetermined peripheral portion of the gain medium; and,

wherein the urging means has an astigmatic aberration, such aberration having a greater magnification along the predetermined direction than along a direction perpendicular to said predetermined direction.

4,433,419
ELECTRODE PURGE SLEEVE FOR GLASS MELTING FURNACES

Michael Williamson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 23, 1982, Ser. No. 371,159
Int. Cl.³ C03B 5/027
U.S. Cl. 373—37 12 Claims

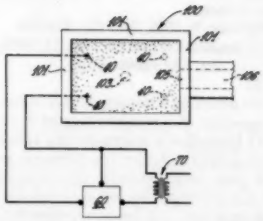


1. A gas purge sleeve assembly for an electric heating electrode mounted horizontally in a forehearth of a furnace comprising in combination with an electric heating electrode made of a material subject to attack and deteriorizton by the atmosphere under high temperature operating conditions, a tubular section having an internal configuration conforming to that of the exterior of the electrode in the region to be protected against atmospheric attack and an internal dimension slightly larger than said electrode portion, said tubular section extending over a length of the electrode from the refractory wall of the forehearth through which the electrode extends to a position along the length of the electrode safely beyond that which, during operation of the electrode, reaches a high temperature at which the electrode material is subject to deterioriation by attack of atmospheric gases, said tubular section being sealed against gas leakage at said wall and being provided with a second gas seal against leakage of gas therefrom at the opposite end of said tubular section being provided with a gas inlet means for supply of inert gas thereto under pressure, a gas outlet means having a closing valve associated therewith, whereby gas can be released from said tubular section to purge atmospheric gases from said sealed tubular section and to which pressure instrumentation may be connected for monitoring of the internal pressure of inert gas supplied to said section.

4,433,420
METHOD AND APPARATUS FOR DETERMINING THE LEVEL OF SLAG CONTAINING IRON OR IRON COMPOUNDS IN A GLASS MELTING FURNACE

Charles S. Dunn, Pataskala, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 10, 1982, Ser. No. 376,812
Int. Cl.³ C03B 5/027; F27D 21/04
U.S. Cl. 373—39 13 Claims



1. An apparatus for determining the level of slag containing iron and iron compounds in a glass melting furnace comprising:

a furnace enclosure having sidewalls and a bottom wall;

electrically conductive elements protruding through the walls of the furnace enclosure above the lowest level of the bottom wall at a level at which the slag is to be detected;

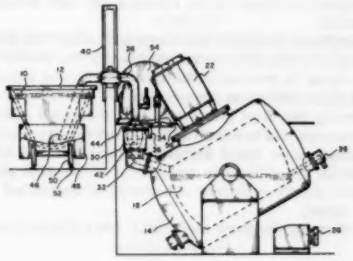
a means for determining the change in resistance between pairs of the electrically conductive elements; and

a means responsive to the change in resistance to activate an audible alarm to initiate the draining of the slag.

4,433,421
CONTROLLED ATMOSPHERE MELTING OF MOLTEN SLAG CHARGE

Patrick J. Wooding, Moorestown, N.J., assignor to Wooding, Indian Mills, N.J.

Filed Dec. 7, 1981, Ser. No. 328,422
Int. Cl.³ F27D 3/14
U.S. Cl. 373—79 5 Claims

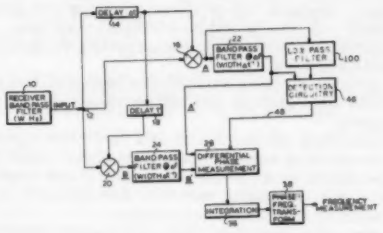


1. In an electric melting furnace for the production of mineral wool from slag including a carbon-lined fully enclosed crucible, means for controlling the atmosphere within said crucible, electric means for heating the slag within said crucible, a taphole for removing molten slag from said crucible and means for feeding slag into said crucible for heating the same without allowing atmospheric gases to enter said crucible; the improvement in said feeding means including means for feeding molten slag into said crucible and including an inlet feed port and a refractory lined feed tube having one end adapted to be placed in sealing engagement with said inlet feed port and means for reducing the atmospheric pressure within said feed tube to at least initiate the flow of molten slag from an external receptacle into said tube and then into said crucible.

4,433,422
FREQUENCY MEASURING SYSTEM FOR ALTERNATING FREQUENCY SIGNALS

Richard R. Kurth, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,196
Int. Cl.³ H04B 3/46; H04M 1/50
U.S. Cl. 375—10 21 Claims



1. A method of measuring the center frequency of an incom-

ing frequency shift keyed signal having known shift frequency, known key rate, and known key period comprising

a. delaying the incoming signal by a first time interval to produce a first delayed signal,

b. multiplying the first delayed signal by incoming signal to produce a first product signal having sum and difference components,

c. filtering the first product signal to pass the difference component thereof while rejecting the sum component thereof,

d. delaying the incoming signal by a second time interval, not equal to said first time interval, to produce a second delayed signal,

e. multiplying the second delayed signal by the incoming signal to produce a second product signal having sum and difference components,

f. filtering the second product signal to pass the difference component thereof while rejecting the sum component thereof,

g. multiplying the difference component of the first product signal with the difference component of the second product signal to produce a third product having phase sum and phase difference components,

h. filtering the third product to pass the phase difference component and to reject the phase sum thereby producing a phase angle signal representing the phase difference between the difference component of the first product signal and the difference component of the second product signal,

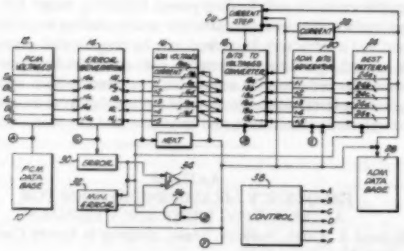
i. transforming the phase angle signal into a frequency signal.

4,433,423

HIGH QUALITY DELTA MODULATOR

Scott M. Golding, Costa Mesa, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Jan. 29, 1982, Ser. No. 344,131
Int. Cl.³ H03K *13/22*; H04B *12/04*
U.S. Cl. 375—30 **11 Claims**



1. A method for generating a series of delta modulation data signals at a predetermined clock rate, corresponding to a predetermined analog waveform, comprising the steps of:

(a) providing a series of generated digital signals corresponding to amplitude values of said waveform, and having a sample rate equal to said predetermined clock rate;

(b) storing sequential groups of sequential digital signals taken from said series;

(c) providing a series of predetermined patterns of delta modulation data signals for each said group of sequential digital signals;

(d) converting said patterns of delta modulation signals into corresponding sequences of derived digital signals corresponding to the amplitude values, taken at said sample rate, of a delta modulation waveform derivable from said sequence by way of delta demodulation;

(e) comparing, for each said group of generated digital signals, each of said sequences of derived digital signals with its associated group, and selecting for each said group said sequence of derived digital signals which has the least quantifiable difference, according to a predetermined relationship, with said associated group of generated digital signals;

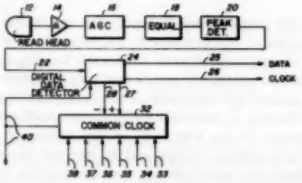
(f) storing in a sequential order at least one delta modulation signal from each said pattern of delta modulation signals associated with said selected sequences.

4,433,424

MULTICHANNEL COMMON CLOCK

Louis Taber, and Don G. East, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 11, 1981, Ser. No. 262,719
Int. Cl.³ H04L *7/02*
U.S. Cl. 375—106 **9 Claims**



1. In a data transmission system wherein data is transmitted to or from magnetic storage means on multiple parallel channels in the absence of a synchronizing channel, with single source clocking information incorporated with data on each channel,

variable frequency clocking means operative at a clocking rate which is an integral multiple of the channel signal baud rate,

means for supplying signals from said clocking means to each individual channel subsystem,

means associated with the clocking means and each channel operable at the bit rate or any subharmonic of the bit rate for monitoring the phase error of each channel of the system with respect to said clocking signals, and means for applying a clock correction signal to said variable frequency clocking means which is a function of the phase errors of all the data channels of the system, whereby data transmitted under single-source clocking control can be resynchronized for further processing by utilizing a single clock for the multiple channel.

4,433,425

METHOD AND APPARATUS FOR DETECTING THE TRAINING SEQUENCE FOR A SELF-ADAPTING EQUALIZER

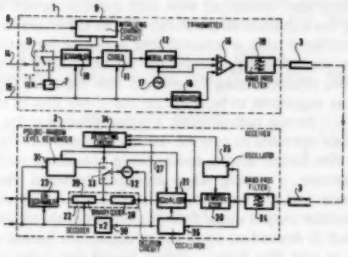
Bogena de Jaeger, Paris, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 9, 1981, Ser. No. 329,096
Claims priority, application France, Dec. 12, 1980, 80 26455
Int. Cl.³ H04L *7/10*
U.S. Cl. 375—113 **8 Claims**

1. A method for detecting a training sequence for initializing a self-adaptive equalizer of a receiver located at one end of a synchronous data transmission system having at the other end a transmitter comprising a coder transforming groups of n consecutive bits into corresponding successive multivalent symbols, where n is an integer not less than unity, a group of n consecutive first logic state bits being transformed into a null symbol having a frequency spectrum null and a sequence of groups of n consecutive second logic state bits in a sequence of symbols having a frequency spectrum substantially constituted by a single large amplitude line, said system being of a type which uses, when setting up a link, an initializing procedure comprising a synchronizing sequence followed by a training sequence, the synchronizing sequence at least ending with a

period during which a sequence of groups of n consecutive second logic state bits are transmitted and the training sequence beginning with at least one group of n first logic state bits; wherein the method of detecting the training sequence comprises the steps of:

monitoring the symbols received at said one end but not yet equalized;



detecting in said received symbols the presence of a wave of large amplitude with a frequency spectrum substantially constituted by a single large amplitude line;

detecting the presence of a first drop in absolute amplitude that follows in said received symbols the presence of said wave and lasts for at least one symbol period; and

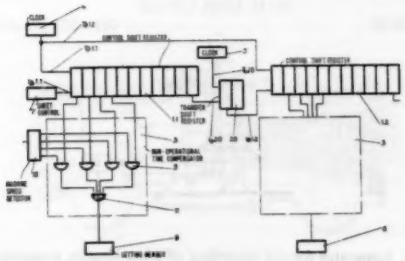
treating said detected drop as constituting said null symbol corresponding to the first group of n first logic state bits at beginning of the training sequence.

4,433,426

CONTROL SYSTEM FOR PRINTING MACHINES

Karl-Heinz Förster, Dresden; Henner Hettmann, Coswig; Volker Eichler, Weinböhla; Albrecht Johne, Dresden; all of German Democratic Republic, assignor to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Filed Jun. 16, 1980, Ser. No. 160,099
Int. Cl.³ G06F *7/38*
U.S. Cl. 377—2 **7 Claims**



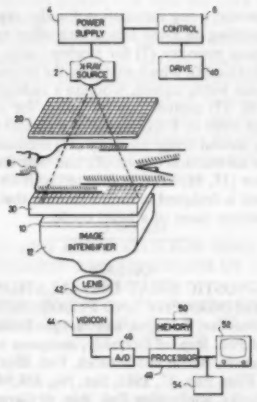
1. A control system for providing an exact periodic synchronization of a plurality of working elements of a printing machine having a sheet feeder and a speed detector with a plurality of outputs, comprising at least one control shift register and a transfer shift register each having a clock input, an information input and a plurality of stages provided respectively with an output; a first timing device connected to the clock input of the control shift register; a source of sheet control pulses coupled to the information input of said control shift register to start up the shifting operation; at least one nonoperative time compensator including a logic switching circuit connected to the outputs of said seed detector and to a first group of the stages of said control shift register, and an output connected to one of said working elements; and a second timing device for generating a synchronizing pulse during each working cycle of the machine, said transfer shift register having its information input connected to one output in another group of stages of said control shift register and its clock input connected to said second timing device to activate a subsequent working element.

4,433,427

METHOD AND APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION SUCH AS X-RAYS

Daniel I. Barnea, Tel-Aviv, Israel, assignor to Elscint, Inc., Boston, Mass.

Filed Jan. 26, 1982, Ser. No. 342,732
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—146 **24 Claims**



1. A method of examining a body by means of penetrating radiation projected through the body onto a two-dimensional radiation-sensitive surface to produce a two-dimensional pattern of the radiation absorbed by the body; characterized in:

disposing, between the body and the source of said radiation, a pre-body collimator having a two-dimensional array of radiation-transmitting holes each bordered by radiation non-transmitting walls;

effecting a plurality of successive exposures of said body by projecting said radiation through said collimator and said body during a plurality of successive exposure periods in each of which the radiation source is at a different location with respect to the collimator, such that during the successive exposures, the radiation from the source impinging on the same elements of the radiation-sensitive surface passes along different ray paths defined by the holes in the collimator;

detecting and storing the radiation level received by said radiation-sensitive surface elements during each of said exposure periods;

and processing said stored radiation levels to reconstruct said two-dimensional radiation pattern with enhanced resolution.

4,433,428
DIAGNOSTIC X-RAY INSTALLATION FOR THE REPRESENTATION OF ORGANS

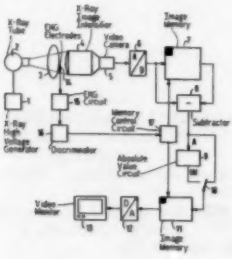
Joerg Haendle, Erlangen, and Mircea Alexandrescu, Braeuningshof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,292

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124583

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—95 **2 Claims**



1. A diagnostic x-ray installation for the representation of organs, comprising an x-ray image intensifier television chain (4, 5), an image memory (7) for storing video signals, and a subtraction device (8), which subtracts the stored video signals and the current video signals, wherein a radiographic control device (15, 16, 17) derives control pulses for controlling the image storage from an EKG signal of a patient (3), characterized in that a second image memory (11) is connected with the output of the subtraction device (8), and that the radiographic control device (15, 16, 17) is connected to both image memories (7, 11) and is designed in such a manner that it triggers the storage at various times of a heart cycle.

4,433,429
DIAGNOSTIC X-RAY INSTALLATION FOR RADIOGRAPHY AND FLUOROSCOPY

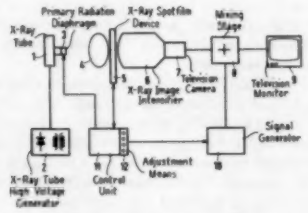
Johann Finkenzeller, Erlangen, and Juergen Reinhardt, Aurachtal, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,942

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010378

Int. Cl.³ H05G *1/28*

U.S. Cl. 378—99 **5 Claims**



1. A diagnostic X-ray installation for radiography and fluoroscopy, said installation comprising an X-ray tube for supplying X-ray energy along an X-ray beam path; an X-ray spotfilm device for positioning an X-ray film in the X-ray beam path during radiography so as to effect exposure of successive subdivisions of the film in accordance with a selected film exposure format; an x-ray image intensifier television chain including an X-ray image intensifier arranged in the X-ray beam path for receiving an X-ray image during fluoroscopy and for supplying a corresponding optical image, a television camera optically coupled with said X-ray image intensifier for supplying a video signal in accordance with the optical image supplied by said X-ray image intensifier during fluroscopy, and a monitor coupled with the television camera for effecting display of the video signal therefrom as a television picture; a control unit connected with said spotfilm device for controlling the exposure of the X-ray film in the X-ray beam path in accordance with a selected film exposure format and having film format setting means for selecting film format setting values characterizing the desired film exposure format of the X-ray exposures to be made on the X-ray film of the spotfilm device during radiography; a signal generator for generating signals operable to control the monitor and having an output, the film format setting means being connected with the signal generator, a mixing stage arranged between the television camera and the monitor, said mixing stage receiving a signal generator output signal from the output of the signal generator which is dependent upon the selected film format setting values at said film format setting means and being operable to superimpose said signal generator output signal on the video signal delivered by the television camera for the purpose of fading-in a representation of the selected film format setting values into the television picture of the monitor, said signal generator supplying as said signal generator output signal a picture generating signal for producing a symbolic pictorial display representing graphically the selected film exposure format and the progress of the X-ray exposures during radiography so that said symbolic pictorial display is faded into the television picture on said monitor, for graphically representing operating status during radiography.

4,433,430
APPARATUS FOR THE AREAL RECORDING OF X-RAY IMAGES

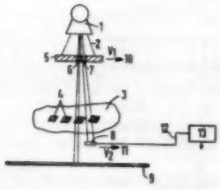
Georg Fredzell, Stockholm, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,004

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121176

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—108 **8 Claims**



1. Apparatus for the recording of x-ray images, comprising an x-ray source, an image recording carrier, as well as at least one diaphragm, arranged between the x-ray source and a subject to be examined and exhibiting at least one aperture, for the purpose of producing a first radiation beam, in which the diaphragm is moved relatively to the subject and image recording carrier in such a fashion that the subject is irradiated and imaged in an area fashion, characterized in that the diaphragm (5) exhibits at least one additional aperture (7) arranged in such a fashion that the additional radiation beam passing through said additional aperture (7), irradiates a subject region to be imaged chronologically later, and that, between the subject (3) and the image recording carrier (9) in the region of the additional radiation beam, detector means (8) for the direct sensing of the x-radiation penetrating the subject (3) is provided, and radiation exposure control means (13) coupled

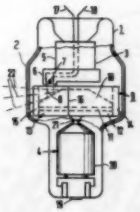
with the detector means, which in dependence on the output signal from the detector means, controls the radiation dose, reaching the image recording carrier (9), for the region to be imaged later.

4,433,431

ROTATING ANODE X-RAY TUBE

Manfred Pfeiler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,925
Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117726
Int. Cl.³ G21K *3/00*
U.S. Cl. 378—157 **4 Claims**



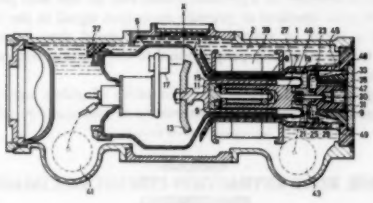
1. A rotating anode x-ray tube comprising a shaft, a rotating anode on the shaft designed for generating x-rays with different wavelenghts, characterized in that filters are rotationally integrated with the anode in that they are rigidly connected to the shaft of the anode and form walls lying at right angles relative to the beam output direction.

4,433,432

X-RAY TUBE APPARATUS

Katsutoshi Nii; Kinpei Okano; Motomichi Doi, all of Hitachi, and Minoru Kitsuya, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,016
Claims priority, application Japan, Nov. 4, 1980, 55-153911
Int. Cl.³ H01J *35/16*
U.S. Cl. 378—193 **19 Claims**



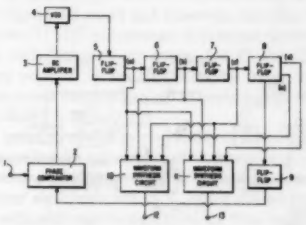
1. An X-ray tube apparatus comprising:
a housing forming an accommodation chamber;
a rotary anode X-ray tube disposed inside said housing and including electron beam generation means, rotor means having an anode target for generating X-rays, and bearing support means for supporting bearings which support said rotor means;
support means for resiliently supporting said rotary anode X-ray tube to said housing, fixed to said bearing support means; and
vibration damping means disposed outside said rotary anode X-ray tube and engaging with at least one of said bearing support means and said support means.

4,433,433

SAMPLING PULSE FORMING CIRCUIT FOR FM STEREO DEMODULATOR

Atsushi Ogawa, and Yoshimasa Hayashi, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1981, Ser. No. 263,884
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—7 **10 Claims**



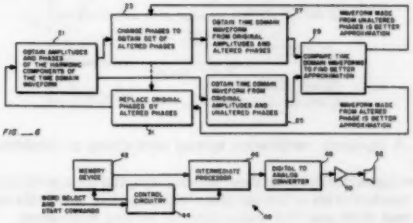
1. A sampling pulse generator circuit of a stereo demodulator with a sample and hold system, comprising:
a phase lock loop circuit receiving as its input the pilot signal of an FM stereo broadcast and having a multiple number of frequency dividers in cascade where the output from each frequency divider is at least one train of rectangular pulses of predetermined frequency, and
first and second waveform synthesis circuits receiving as inputs selected outputs of said frequency dividers where the narrowest pulse width input to said waveform synthesis circuits is one of said train of rectangular pulses to thereby produce, respectively, first and second sampling pulses having 180° phase difference to each other, each with a predetermined and stable pulse width determined by said narrowest pulse width input.

4,433,434

METHOD AND APPARATUS FOR TIME DOMAIN COMPRESSION AND SYNTHESIS OF AUDIBLE SIGNALS

Forrest S. Mozer, 38 Somerset Pl., Berkeley, Calif. 94707

Filed Dec. 28, 1981, Ser. No. 335,312
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—30 **12 Claims**

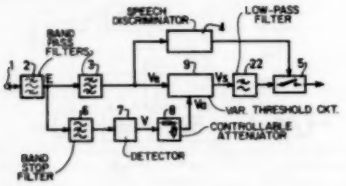


1. A method for compressing a time domain information signal, said method comprising the steps of:
receiving said information signal; and
adjusting the phase of harmonic components of said received signal to produce an equivalent signal, said equivalent signal having sampled amplitude values at selected sample times, said amplitude values being limited to a selected maximum number of amplitude levels less than the number of amplitude levels utilized to define said information signal at said selected sample times, said equivalent signal having a power spectrum substantially the same as said information signal.

4,433,435
ARRANGEMENT FOR REDUCING THE NOISE IN A SPEECH SIGNAL MIXED WITH NOISE

Guy A. J. David, Thiais, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,500
Claims priority, application France, Mar. 18, 1981, 81 05410
Int. Cl.³ H04B 15/00
U.S. Cl. 381—94 6 Claims

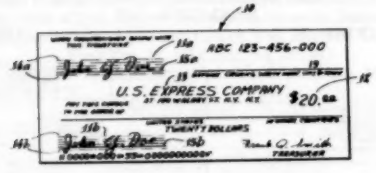


1. An arrangement for reducing the noise in an input signal formed by a speech signal mixed with noise, characterized in that the arrangement comprises a band-stop filter which receives the input signal and eliminates a frequency band which is approximately centered around the average frequency of the first formant of the speech signal and which covers at least a portion of the frequency band of the first format, a detection circuit for detecting the level of the output signal of the band-stop filter, said detection circuit having a long time constant to the order of the time constant of the variation of the average noise level, and a variable-threshold circuit to which a threshold signal is applied, said threshold signal being formed from the detected signal and which is arranged for transmitting the variation of the input signal when the absolute value of said input signal is higher than the threshold level.

4,433,436
SIGNATURE VERIFICATION SYSTEM

W. Robert Carnes, 32 Phillips La., Darien, Conn. 06820

Filed May 18, 1981, Ser. No. 264,344
Int. Cl.³ G06K 9/00
U.S. Cl. 382—3 9 Claims



1. A signature verification system comprising in combination:

two signature fields on sheet material adapted for a person to handwrite his or her signature within each of said fields on said sheet material with a (tipped) writing instrument,

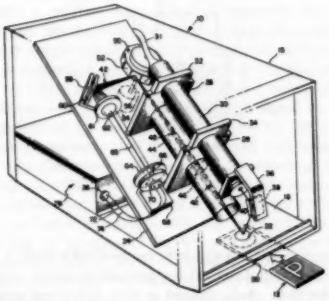
each of said fields having incorporated therein a similar pattern of lines of a pressure sensitive material of a type that will produce a visible mark at each point at which more than a predetermined minimum of pressure is applied thereto and with which the density of the mark thus produced is proportional to the amount of said pressure greater than said minimum,

whereby when one signature is handwritten in one of said fields and another signature is subsequently handwritten in the other of said fields each of said signatures produces a distinctive pattern of visible marks, and a distinctive pattern of densities of said marks, in the respective fields by lines of said signatures crossing lines of said pressure sensitive material, whereby the first written signature provides a specimen pattern of said marks with which the pattern of said marks produced by said subsequently written signature can be compared for providing an indication whether or not the two signatures were written by the same person.

4,433,437
METHOD AND APPARATUS FOR VERIFYING SECURITY LABELS

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 12, 1981, Ser. No. 262,898
Int. Cl.³ G06K 9/00
U.S. Cl. 382—31 3 Claims



1. A method for verifying the authenticity of security labels of the type having a series of parallel lenticules of predetermined spatial frequency formed thereon comprising the steps of:

supporting a security label to be verified so that the lenticules thereof lie in a flat or nearly flat plane;

directing a beam of radiation at said security label at a predetermined angle of incidence so that the lenticules of said security label diffract said beam of radiation into a series of wavefronts which reinforce one another to form a diffraction pattern having principle maxima that are separated by equal or nearly equal angles;

successively imaging said diffraction pattern maxima on a photodetector at a predetermined rate so that said photodetector operates to provide an output signal in the form of a series of pulses separated by equal time intervals which are linearly proportional to the angular separation between said maxima; and

comparing the frequency of said series of pulses against a standard to verify the authenticity of said security label.

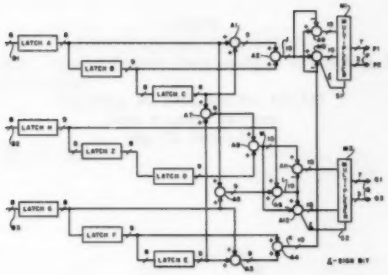
4,433,438
SOBEL EDGE EXTRACTION CIRCUIT FOR IMAGE PROCESSING

Guy D. Couturier, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 324,914
Int. Cl.³ G06K 9/64; H04N 5/14
U.S. Cl. 382—41 7 Claims

1. An image processing device on a single integrated circuit chip for performing the Sobel algorithm $S=\{[(a+2b+c)-(g+2f+e)]^2+\{(a+2h+g)-(c+2d+e)]^2\}^{\frac{1}{2}}$ with digitized input data words derived from an image by use of a 3×3 window in the form

a	b	c
h	z	d



-continued

g	f	e

supplied via input data bus means, said device comprising:

input logic means including input register means and parallel adder means for performing the functions $J=(a+2b+c)$, $K=(g+2f+e)$, $L=(a+2h+g)$, $M=(c+2d+e)$, $P=|J-K|$ and $Q=|L-M|$ which produces words P and Q, the input register means being coupled to said input data bus means;

first memory means storing binary words representing the squares of the binary numbers 0 to 111 1111 with 13 bits per word for the squares using 7-bit addresses, first selection means for selecting the seven least significant bits of each of said words P and Q if the remaining more significant bits are all zero's and otherwise selecting the binary number 111 1111 as addresses to produce memory outputs from said first memory means for P^2 and Q^2, register means coupled to the first memory means output and adder means coupled thereto to provide a 13-bit word for the value $V=(P^2+Q^2)$;

second memory means storing binary words of six bits each representing the square root of V, comprising a first memory section of 1024 words with addresses formed from the ten least significant bits of V, and a second memory section with addresses formed from the three most significant bits of V, with second selection means for selecting an output from said first section if the three most significant bits are all zero's and otherwise to select an output from said second section, and means to supply the selected output as the Sobel square root value S.

272,674

FRONT PANEL FOR A CAP

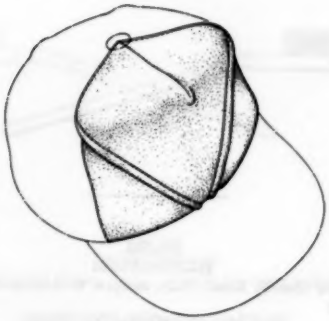
Robert G. Varsane, Oxford, Conn., assignor to U.S. Cap, Inc., Prospect, Conn.

Filed Sep. 16, 1980, Ser. No. 187,732

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—260



272,675

SHOE SOLE

Pierre Bidegain, Pau, France, assignor to Bidegain S.A., Pau, France

Division of Ser. No. 9,810, Feb. 6, 1979, Pat. No. Des. 259,522.

This application Jun. 16, 1981, Ser. No. 274,236

Claims priority, application France, Nov. 21, 1978, 855

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—320

272,676

COMBINED FLASHLIGHT AND UMBRELLA

Arch J. MacDonald, 6755 24th Ave. NW., Seattle, Wash. 98117

Filed Aug. 17, 1981, Ser. No. 293,600

Term of patent 14 years

Int. Cl. D3—*03*

U.S. Cl. D3—5

272,677

WALKING CANE

Steven C. Bove, 5225 Brookdale Dr., Brooklyn Park, Minn. 55443, and Herbert J. Garelick, 661 Woodlawn Ave., St. Paul, Minn. 55116

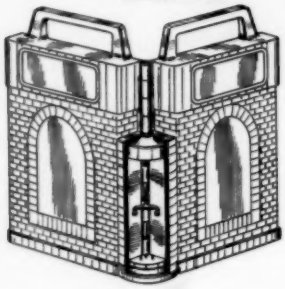
Filed Dec. 18, 1981, Ser. No. 332,167

Term of patent 14 years

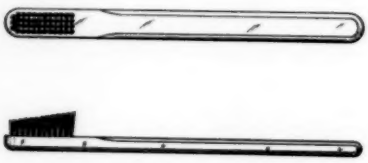
Int. Cl. D3—*03*

U.S. Cl. D3—9

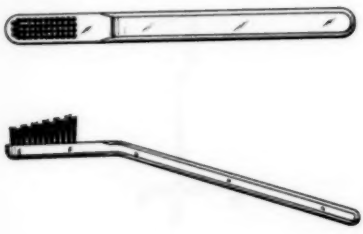
272,678
CARRYING CASE FOR DOLLS
Dale I. Goldberg, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Nov. 25, 1981, Ser. No. 325,077
Term of patent 14 years
Int. Cl. D3—02
U.S. Cl. D3—73



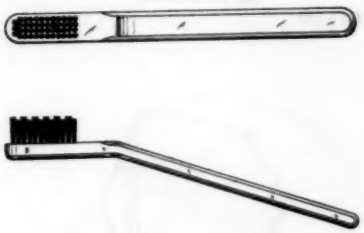
272,679
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,861
Term of patent 14 years
Int. Cl. D4—02
U.S. Cl. D4—25



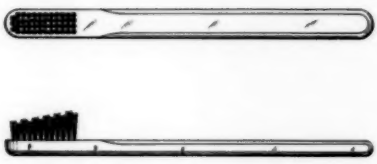
272,680
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,862
Term of patent 14 years
Int. Cl. D4—02
U.S. Cl. D4—25



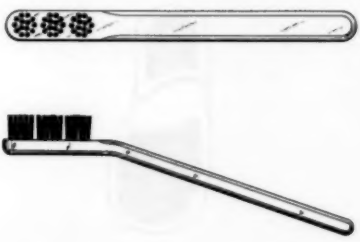
272,681
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,863
Term of patent 14 years
Int. Cl. D4—02
U.S. Cl. D4—25



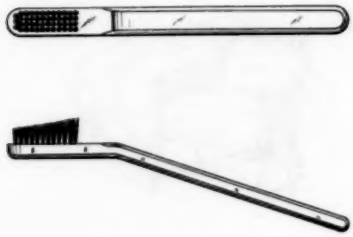
272,682
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,864
Term of patent 14 years
Int. Cl. D4—02
U.S. Cl. D4—25



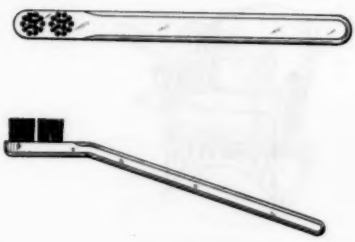
272,683
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,865
Term of patent 14 years
Int. Cl. D4—02
U.S. Cl. D4—25



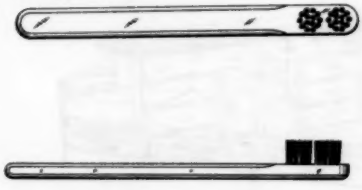
272,684
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 263,938
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



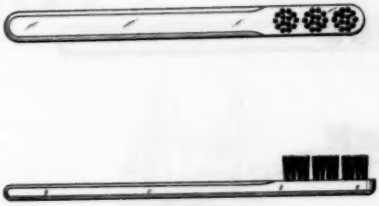
272,685
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,047
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



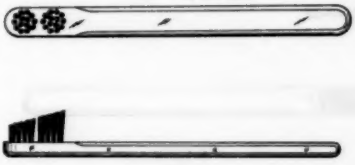
272,686
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,122
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



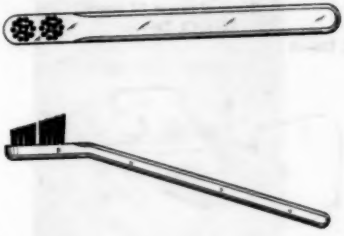
272,687
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,123
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



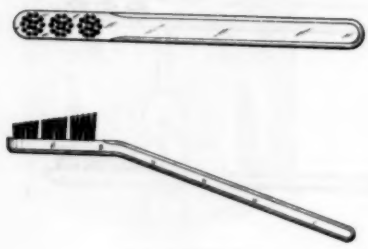
272,688
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,124
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



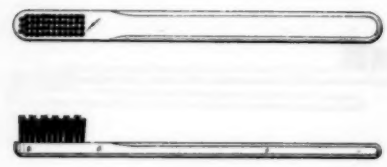
272,689
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,125
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



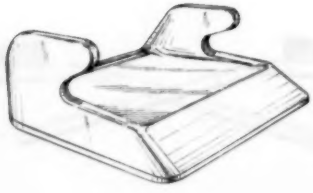
272,690
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,191
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



272,691
TOOTHBRUSH
Gabriele Stocchi, Rome, Italy, assignor to Avantgarde S.p.A., Italy
Filed May 15, 1981, Ser. No. 264,192
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



272,692
CHILD'S SECURITY SEAT FOR VEHICLES
Leif Hallgren, Hyltebruck, Sweden, assignor to Hallgrens Industri AB, Hyltebruk, Sweden
Filed Jan. 4, 1982, Ser. No. 336,573
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9

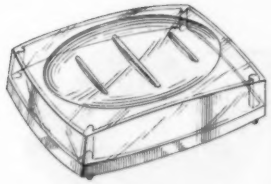


272,693
CHAIR
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Jun. 22, 1981, Ser. No. 275,916
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

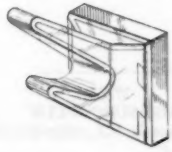
272,694
ROCKING CHAIR
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Jun. 22, 1981, Ser. No. 275,919
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

272,695
SOFA
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Jul. 17, 1981, Ser. No. 284,363
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

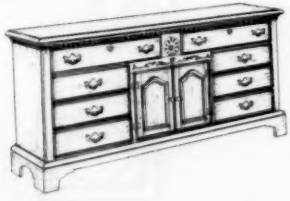
272,696
STANDING SOAP DISH
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Oct. 8, 1981, Ser. No. 309,837
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89



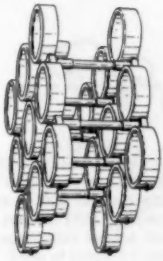
272,697
ROBE HOOK
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Oct. 8, 1981, Ser. No. 309,836
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—122



272,698
DRESSER OR THE LIKE
Harold V. Aulbert, High Point, and Charles M. Horton, Troutman, both of N.C., assignors to American Drew Division of Sperry and Hutchinson Furniture, Inc., High Point, N.C.
Filed Apr. 8, 1981, Ser. No. 252,267
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

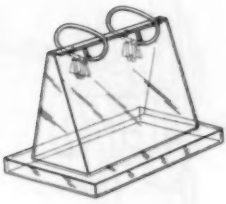


272,699
MODULAR STORAGE RACK FOR BOTTLES OR THE LIKE
Danny Godfrey, 21 Meadow View Rd., Bexley, Kent DA5 1HP, England
Filed Nov. 16, 1981, Ser. No. 321,902
Claims priority, application United Kingdom, May 21, 1981, 1000600
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—188



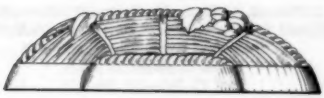
272,700
RUG
Sally G. Irish, R.F.D. 2, Box 172A, Marshall, Va. 22115
Filed Aug. 26, 1981, Ser. No. 296,536
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—211

272,701
PHOTOGRAPH DISPLAY
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Oct. 22, 1981, Ser. No. 314,004
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

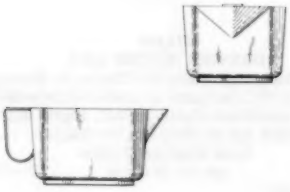


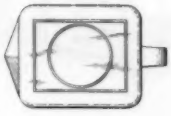
272,702
SPRING CLIP FOR FRAMELESS PICTURE MOUNTING
John M. Kingsley, Jr., 16 Will Merry La., Greenwich, Conn. 06830
Filed Apr. 8, 1981, Ser. No. 252,090
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246

272,703
FOOD MOLD
David W. Miller, Salem, Mass., assignor to Benjamin & Medwin, Inc., New York, N.Y.
Filed Apr. 16, 1981, Ser. No. 254,785
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—43

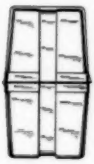


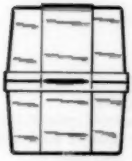
272,704
MEASURING CUP
Lawrence D. Smith, Ramsey, N.J., assignor to IDL Mfg. & Sales Corp., Carlstadt, N.J.
Filed Sep. 25, 1981, Ser. No. 305,465
Term of patent 14 years
Int. Cl. D07—*01;* D10—*04*
U.S. Cl. D7—50





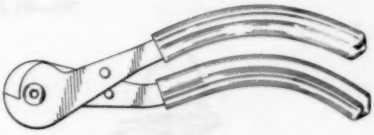
272,705
PORTABLE COOLER
Marten Gottsegen, Chicago; Fred F. Drucker, Lincolnshire, and Henry Glass, Northfield, all of Ill., assignors to Gotham Chicago Corporation, Chicago, Ill.
Filed Nov. 5, 1980, Ser. No. 204,257
Term of patent 14 years
Int. Cl. D07—*01;* D03—*01*
U.S. Cl. D7—77



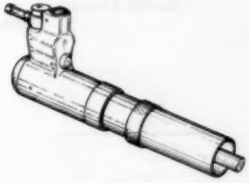


272,706
HALF ROUND HARDIE
Walter H. Garner, P.O. Box 369, Arroyo Grande, Calif. 93420
Filed Oct. 9, 1981, Ser. No. 310,144
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—46

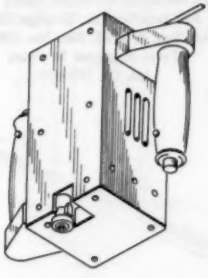
272,707
LARGE HEADED CABLE CUTTER
Frank E. Shaffer, 33 Beach Dr., Newport Beach, Calif. 92660
Continuation-in-part of Ser. No. 29,994, Apr. 16, 1979, Pat. No. Des. 261,477. This application Apr. 20, 1981, Ser. No. 255,870
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—52



272,708
PNEUMATIC RIVETING HAMMER
Per A. L. Gidlund, Täby, and Per G. Wedlin, Huddinge, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Jun. 18, 1981, Ser. No. 274,716
Claims priority, application Sweden, Dec. 18, 1980, 80002561
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—61



272,709
POWER TOOL FOR LAMINATE TRIMMING AND EDGE FINISHING
Henry Atherton, 1545 Vine St., Denver, Colo. 80206
Filed Nov. 18, 1981, Ser. No. 322,532
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—67



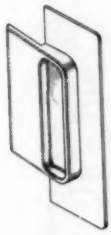
272,710
PAVING BREAKER
Milton J. Antonick, Royal Oak, and Stanley E. Thorwaldsen, Grosse Pointe Farm, both of Mich., assignors to Thor Power Tool Company, Aurora, Ill.
Filed Dec. 1, 1981, Ser. No. 326,240
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—67

272,711
WOODWORKING STRAIGHT EDGE
Norman Griset, 380 Jennifer La., Orange, Calif. 92669
Filed Sep. 4, 1981, Ser. No. 299,489
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

272,712
COMBINED SLIDE HAMMER NAIL PULLER AND BUILDING WRECKING TOOL
Steven R. Allen, Star Rte., Box 858, Glenwood, Oreg. 97120
Filed Dec. 30, 1981, Ser. No. 335,605
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—89

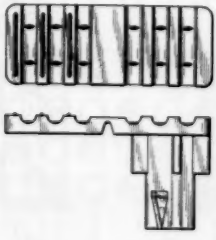
272,713
HAND PLANE
Robert R. Hayes, Euclid, and George H. Frost, Kent, both of Ohio, assignors to Oatey Co., Cleveland, Ohio
Filed Aug. 14, 1981, Ser. No. 292,993
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—90

272,714
COMBINED SLIDING SCREEN DOOR PULL WITH SCREEN GUARD THEREFOR
C. William LeGrand, 1460 N. Grove Ave., Upland, Calif. 91786
Filed Jan. 12, 1981, Ser. No. 224,093
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—301



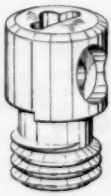
272,715
CHILD SAFETY LATCH
Wilbur J. Bailey, Wethersfield, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Oct. 7, 1981, Ser. No. 309,445
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331

272,716
CORD LOCK
Rudolph E. Muench, Shelby, N.C., assignor to Fasco Controls Corporation, Shelby, N.C.
Filed Oct. 7, 1981, Ser. No. 309,243
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

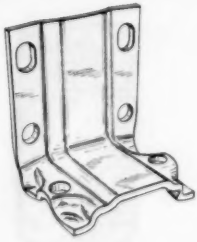


272,717
SAFETY HOOK
Christian Faidide, Maringues, France, assignor to S.A.R.L. Wichard, Thiers, France
Filed Jul. 14, 1981, Ser. No. 283,295
Claims priority, application France, Jan. 14, 1981, 810118
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

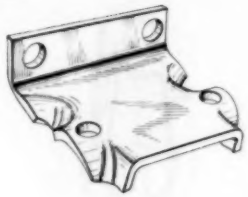
272,718
STRAIN RELIEF CABLE FASTENER
Giltner J. Knudson, 3269 Minnesota, Costa Mesa, Calif. 92627
Filed Jul. 27, 1981, Ser. No. 287,233
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387



272,719
PLATE FOR ASSEMBLING ELEMENTS OF AGRICULTURAL MACHINERY OR THE LIKE
Magne Skjaeveland, Oksnevadskogen, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Aug. 6, 1981, Ser. No. 290,706
Claims priority, application Norway, Feb. 11, 1981, 61728
Term of patent 14 years
Int. Cl. D8—*08*; D15—*04*
U.S. Cl. D8—394



272,720
PLATE FOR ASSEMBLING ELEMENTS OF AGRICULTURAL MACHINERY OR THE LIKE
Magne Skjæveland, Oksnevadskogen, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Aug. 6, 1981, Ser. No. 290,708
Claims priority, application Norway, Feb. 11, 1981, 61727
Term of patent 14 years
Int. Cl. D8—*08*; D15—*04*
U.S. Cl. D8—394

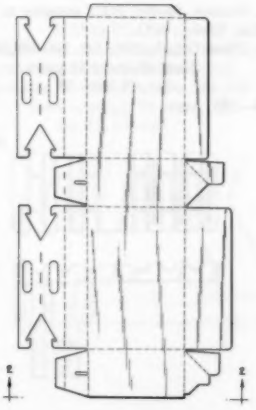


272,721
BOTTLE
Alan P. Grey, 38/39 The Esplanade, St. Helier, Jersey, Channel Islands
Filed Dec. 1, 1980, Ser. No. 211,624
Claims priority, application United Kingdom, May 29, 1980, 995069
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

272,722
JAR OR THE LIKE
David Haakenson, Star Route, LaPorte, Minn. 56461
Filed Sep. 18, 1981, Ser. No. 303,394
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—352

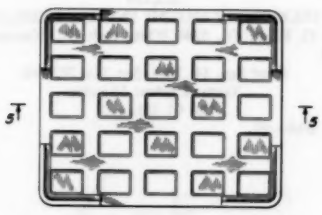
272,723
BOTTLE OR THE LIKE
Robert Baker, Winchester, England, assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 21, 1981, Ser. No. 303,700
Claims priority, application United Kingdom, Mar. 25, 1981, 999629
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

272,724
CARRIER CASE BLANK
Earl J. Killy, Gainesville, Fla., assignor to Manville Service Corporation, Denver, Colo.
Filed Aug. 3, 1981, Ser. No. 289,442
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

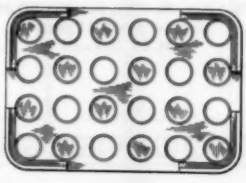


272,725
PULL TAB TEAR CAP FOR MEDICAL LIQUID CONTAINER
Mark E. Larkin, Lindenhurst, Ill., assignor to Abbott Laborstories, North Chicago, Ill.
Filed Apr. 13, 1981, Ser. No. 253,338
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—435

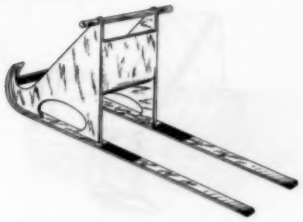
272,726
BOX FOR CULTIVATING VEGETABLES OR THE LIKE
Toshiro Kaneko, 1397 Obama, Yaizu-shi, Shizuoka-ken, Japan
Filed Sep. 24, 1981, Ser. No. 305,372
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



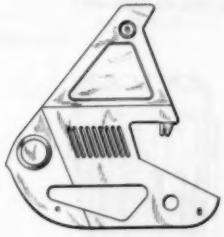
272,727
BOX FOR CULTIVATING VEGETABLES OR THE LIKE
Toshiro Kaneko, 1397 Obama, Yaizu-shi, Shizuoka-ken, Japan
Filed Sep. 24, 1981, Ser. No. 305,373
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



272,728
SLED
Linda M. Svensson, and Agneta E. Svensson, both of 2 Bourne St., Worcester, Mass. 01602
Filed Nov. 23, 1981, Ser. No. 324,094
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—9

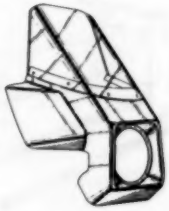


272,729
MOTORCYCLE SIDE COVER
Alwin J. Stahel, Saint Paul, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed Jul. 1, 1981, Ser. No. 279,541
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—126

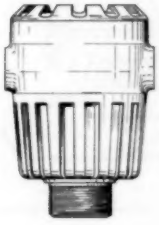


272,730
VEHICLE TIRE
Tooru Osawa, Urawa, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Nov. 25, 1981, Ser. No. 324,890
Claims priority, application Japan, May 29, 1981, 56-22943
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

272,731
MOTORCYCLE FAIRING
David G. Firth, Burnsville, Minn., assignor to Firth Design Group Inc., Minneapolis, Minn.
Filed Feb. 12, 1981, Ser. No. 233,878
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

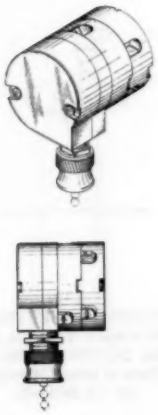


272,732
EXPLOSION PROOF ENCLOSURE FOR ELECTRICAL APPARATUS OR SIMILAR ARTICLE
Brian E. Moore, Greenwood, and Richard D. Buis, Indianapolis, both of Ind., assignors to Endress + Hauser, Inc., Greenwood, Ind.
Filed May 11, 1981, Ser. No. 262,343
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—13

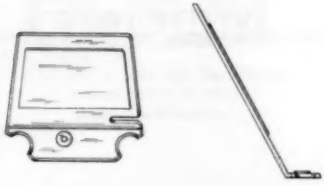


272,733
180° CABLE STRAIN RELIEF AND COVER FOR AN ELECTRICAL CONNECTOR
Pete Cosmos, and Earl W. McCleerey, both of Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 28, 1981, Ser. No. 306,030
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

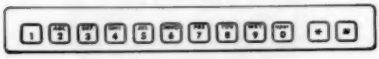
272,734
SWITCH
Wolfgang F. Bienwald, Melville, and David B. Balaban, Douglaston, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Jan. 13, 1982, Ser. No. 340,406
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



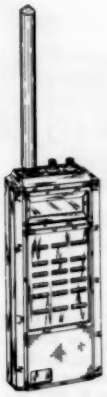
272,735
TELEPHONE MOUNT INDICIA DISPLAY
William G. Frick, Jr., 2240 White Oak Dr., Northbrook, Ill. 60062
Filed Sep. 14, 1981, Ser. No. 302,060
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



272,736
PUSHBUTTON DIAL FOR A TELEPHONE SET OR THE LIKE
John E. Kaczkos, Elk Grove Village, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Nov. 16, 1981, Ser. No. 322,059
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

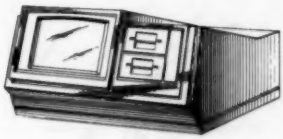


272,737
RADIO
John C. Coons; Jean M. Beirise, both of Cincinnati, Ohio; Richard E. Riley, Indianapolis, Ind.; James M. Gray, Greenwood, Ind., and Mark L. Stow, Indianapolis, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Nov. 18, 1981, Ser. No. 322,519
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

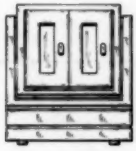


272,738
CONSOLE FOR DATA PROCESSING EQUIPMENT
Melvin H. M. Best, Topanga, Calif., assignor to Teradata Corporation, Inglewood, Calif.
Filed Nov. 2, 1981, Ser. No. 317,317
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—102

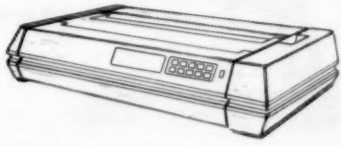
272,739
WORD PROCESSOR
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 20, 1981, Ser. No. 294,425
Claims priority, application Japan, Feb. 24, 1981, 56-7574
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



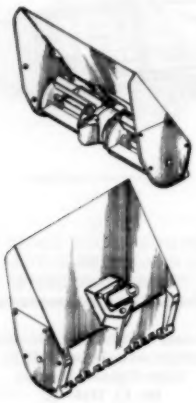
272,740
FLOPPY DISC DRIVE
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 20, 1981, Ser. No. 294,428
Claims priority, application Japan, Feb. 24, 1981, 56-7578
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109



272,741
DATA PRINTER
Werner H. Mailer, Waynesboro, and Carl R. Cline, II, Staunton, both of Va., assignors to General Electric Company, Waynesboro, Va.
Filed Dec. 4, 1981, Ser. No. 327,399
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111

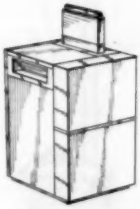


272,742
ATTACHMENT FOR SNOW SHOVEL
Daiji Hoshino, Tokyo, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan
Filed Mar. 13, 1981, Ser. No. 229,284
Claims priority, application Japan, Aug. 6, 1980, 55-318181
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—11

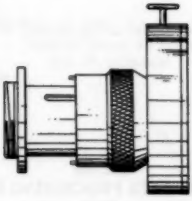


272,743
CLAMP FOR PLATING BARREL
David J. Knox, 13016 Ladana Ct., Santa Fe Springs, Calif. 90670
Filed Jun. 8, 1981, Ser. No. 271,483
Term of patent 14 years
Int. Cl. D15—*09*; D8—*08*
U.S. Cl. D15—144

272,744
X-RAY-FILM-PROCESSOR
Norbert Schlagheck, Fuerstenfeldbruck, and Lutz Rabold, Söcking, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 12, 1980, Ser. No. 216,601
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 5MR587G175/802
Term of patent 14 years
Int. Cl. D16—*03*; 24—*01*
U.S. Cl. D16—34

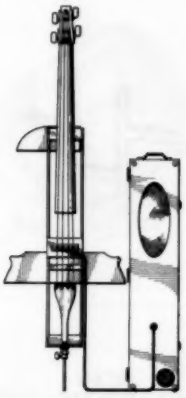


272,745
ADJUSTABLE OPTICAL COUPLER DEVICE
Richard E. Feinbloom, New York; Richard Lepczynski, Brooklyn, and Waldyslaw Oleksy, New York, all of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Nov. 5, 1981, Ser. No. 318,461
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—130

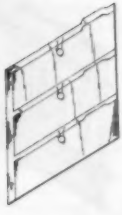


272,746
ORGAN
Thomas E. Kimble, Covington, Ky., assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio
Filed Jun. 15, 1981, Ser. No. 273,619
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—6

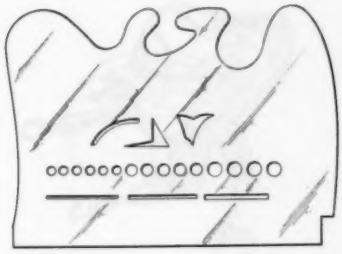
272,747
DEMOUNTABLE STRINGED MUSICAL INSTRUMENT
Ernest Nussbaum, 6009 Johnson Ave., Bethesda, Md. 20817
Filed Nov. 25, 1981, Ser. No. 324,752
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14



272,748
POCKET INSERT FOR A NOTEBOOK
Velma R. Kirk, 6035 Zora St., La Mesa, Calif. 92041
Filed Nov. 3, 1980, Ser. No. 203,044
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33

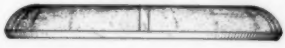


272,749
ARTISTS TEMPLATE
Radu Vero, 345 E. 80th St., New York, N.Y. 10021
Filed Mar. 26, 1982, Ser. No. 362,296
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. 19—39

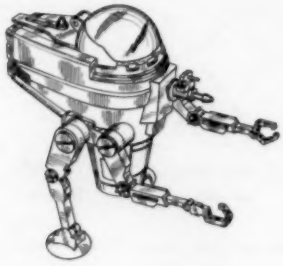


272,750
WRITING INSTRUMENT OR SIMILAR ARTICLE
Richard Luntz, P.O. Box 24234, Lyndhurst, Ohio 44924
Filed Jun. 17, 1981, Ser. No. 274,497
The portion of the term of this patent subsequent to Jul. 12, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

272,751
AERIAL TOY
Rogers F. Brackmann, Wheaton, Ill., assignor to H,H&B, Inc., Downers Grove, Ill.
Filed Jul. 7, 1980, Ser. No. 166,138
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86

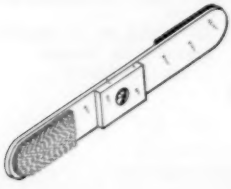


272,752
TOY SPACE VEHICLE
Mark D. Boudreaux, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed May 20, 1982, Ser. No. 380,159
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



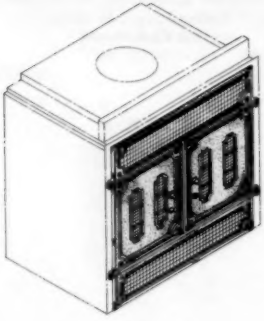
272,753
HAND PUPPET
Lowell J. Carlson, Buffalo, Minn., assignor to Carlson Dolls Co., Maple Lake, Minn.
Filed Mar. 11, 1982, Ser. No. 357,267
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—153

272,754
GOLF GRIP AID
John H. Brewer, 17827 St. Andrews Dr., Poway, Calif. 92064
Filed Nov. 12, 1981, Ser. No. 320,423
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

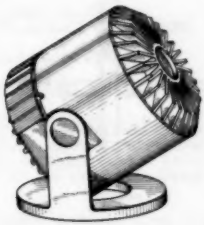


272,755
STOVE GRILLE
Arthur Evans, Williamstown, Mass., assignor to Mohawk Industries, Inc., Adams, Mass.
Filed Jun. 17, 1980, Ser. No. 160,362
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128

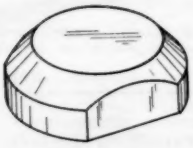
272,756
FRONT PANEL FOR A FIREPLACE
Thomas R. Rehberg, Orange, and John W. Moroney, Glendora, both of Calif., assignors to Mobex Corporation, Fullerton, Calif.
Filed Jan. 12, 1982, Ser. No. 338,893
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128



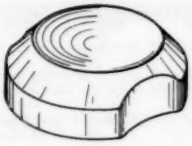
272,757
AIR CLEANER OR THE LIKE
Robert W. Fee, Wichita, and Richard J. Robbins, Derby, both of Kans., assignors to Rival Manufacturing Co., Kansas City, Mo.
Filed Oct. 19, 1981, Ser. No. 312,508
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



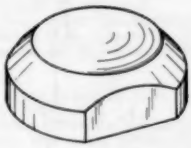
272,758
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,189
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



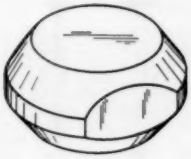
272,759
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,190
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



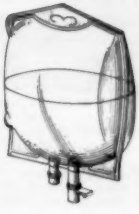
272,760
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,191
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



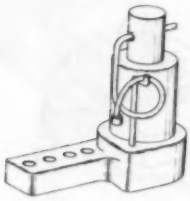
272,761
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,193
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



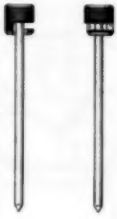
272,762
FLEXIBLE CONTAINER FOR MEDICAL LIQUIDS
John C. Tanner, II, Lake Bluff, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 8, 1981, Ser. No. 271,731
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58



272,763
DENTAL HYGIENE DEVICE
Quentin H. Coffman, 13414 Doty Ave., Hawthorne, Calif. 90250
Filed Oct. 19, 1981, Ser. No. 312,407
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—15



272,764
ORTHOPEDIC PIN
Charles L. Dohogne, San Pedro, Calif., assignor to ACE Orthopedic Manufacturing, Inc., Los Angeles, Calif.
Filed Oct. 14, 1980, Ser. No. 196,691
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

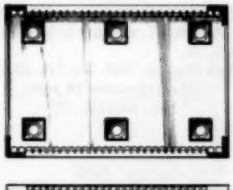


272,765
RESTAURANT BUILDING
Gerald S. Office, Jr., New Carlisle, Ohio, assignor to Ponderosa, Inc., Vandalia, Ohio
Filed Jan. 26, 1982, Ser. No. 342,868
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25

272,766
CORNER BRACKET FOR USE ON A SCAFFOLD, OR SIMILAR ARTICLE
Nathan J. Guerriero, 10140 Utica Way, Cherry Valley, Calif. 92223
Continuation-in-part of Ser. No. 291,621, Aug. 10, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,999
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—68

272,767
PANEL FOR FLOORS, WALLS, OR THE LIKE
Josef Nemeth, Kungälv, Sweden, assignor to Aktiebolaget Wicanders Korkfabriker, Alvangen, Sweden
Continuation of Ser. No. 730,534, Oct. 7, 1976. This application Jun. 11, 1982, Ser. No. 387,670
Claims priority, application Sweden, Apr. 9, 1976, 811; Apr. 9, 1976, 812; Apr. 9, 1976, 813; Apr. 9, 1976, 814; Apr. 9, 1976, 815; Apr. 9, 1976, 816
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

272,768
PALLET OR THE LIKE
John H. Haag, Sr., Evansville, Ind., assignor to Ball Corporation, Muncie, Ind.
Filed Nov. 2, 1981, Ser. No. 317,031
Term of patent 14 years
Int. Cl. D9—*08*
U.S. Cl. D34—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF FEBRUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Waris, Tapio; and Lindroos, Sven-Eric E., 4,432,835, Cl. 162-212.000.

A.P.V. Company Limited, The: *See*—
Wright, Felix W., 4,432,415, Cl. 165-166.000.

AB Samefa: *See*—
Carlsson, Harry, 4,432,144, Cl. 33-180.0AT.

AB Volvo: *See*—
Lind, Lars; Melin, Kent; and Sandberg, Lars, 4,432,430, Cl. 180-197.000.

Abbott Laboratories: *See*—
Dawe, Garfield A., 4,432,761, Cl. 604-253.000.
Dawe, Garfield A., 4,432,762, Cl. 604-253.000.
Gross, James R.; and Bujan, Albert F., 4,432,759, Cl. 604-411.000.
Nadzan, Alex M.; and Granneman, George R., 4,432,985, Cl. 424-267.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, 4,433,347, Cl. 358-342.000.

Abe, Takao; and Hohnishi, Satoru, to Konishiroku Photo Industry Co., Ltd. Direct positive type light sensitive silver halide photographic material. 4,433,050, Cl. 430-542.000.

Abe, Yoshiaki: *See*—
Miura, Haruo; and Abe, Yoshiaki, 4,432,697, Cl. 416-198.00A.

Abele, Manlio G.; and Marshall, Christopher H., to Philips Medical Systems, Inc. Tomographic scanner. 4,433,380, Cl. 564-414.000.

Abels, Theodor; and Honecker, Guter, to Linde Aktiengesellschaft. Lift loader. 4,432,424, Cl. 180-6.480.

Abet Group, The: *See*—
Beckman, John B.; and Blickstein, Martin J., 4,432,699, Cl. 417-63.000.

ACI Australia Limited: *See*—
Granat, Rodney J., 4,432,246, Cl. 73-862.530.

Aciers et Outillage Peugeot: *See*—
Rietsch, Maurice; and Joly, Jean, 4,432,507, Cl. 242-107.40A.

Adachi, Toshio; and Hiratake, Susumu. Apparatus for filling a container with radioactive solid wastes. 4,432,942, Cl. 422-159.000.

Adams, Derek S.: *See*—
Lowndes, Michael W.; Adams, Derek S.; and Arlidge, Neville J., 4,433,278, Cl. 320-48.000.

Adams, John O., to Olin Corporation. Elastomeric testing apparatus. 4,432,240, Cl. 73-822.000.

Adams, Ronald W.; and Johnson, Theodore W., to Albany International Corp. Method of manufacturing upholstery panels. 4,432,822, Cl. 156-148.000.

Addie, Lee W.; and Ollinger, James C., to Armstrong World Industries, Inc. Ceiling tile suspension system. 4,432,182, Cl. 52-480.000.

Adolfsson, Morgan; Brogardh, Torgny; Goransson, Sture; and Ovren, Christer, to Asea Aktiebolag. Optical measurement system for spectral analysis. 4,433,238, Cl. 250-227.000.

Advanced Technology Laboratories, Inc.: *See*—
McAusland, Robert R., 4,432,371, Cl. 128-660.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Raisin, Jean-Pierre; Heiffer, Bernard; and Chirouze, Jean L., 4,432,295, Cl. 112-262.300.

Agency of Industrial Science & Technology: *See*—
Harata, Kazuaki; Morimoto, Satoshi; and Tsuda, Keishiro, 4,432,802, Cl. 106-163.00R.
Hattori, Mitsuro; Harad, Koosuke; and Goto, Tadahiko, 4,432,245, Cl. 73-862.320.
Ishii, Yoshiaki; Ando, Naoyoshi; Kume, Tsutomu; and Fujinami, Shosaku, 4,432,290, Cl. 110-346.000.

Aharoni, Shaul M.: *See*—
Largman, Theodore; and Aharoni, Shaul M., 4,433,116, Cl. 525-420.000.

Aikawa, Naoyuki: *See*—
Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, 4,433,133, Cl. 528-232.000.

Air-Mo Hydraulics, Inc.: *See*—
Wietecha, Robert L., 4,432,569, Cl. 285-18.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Wada, Satomi, 4,432,911, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See*—
Andoh, Masamoto; Ohhori, Harumi; and Kiriyama, Takashi, 4,432,586, Cl. 303-115.000.
Iwasaki, Shinichiro, 4,432,323, Cl. 123-427.000.

Aisslinger, Dieter E.: *See*—
Pusch, Gunter; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,433,025, Cl. 428-207.000.

Akagiri, Kenzo: *See*—
Katakura, Masayuki; Akagiri, Kenzo; and Ookouchi, Motomi, 4,433,254, Cl. 307-350.000.

Akahira, Nobuo: *See*—
Baba, Sueki; Yoshida, Tomio; Akahira, Nobuo; and Yamashita, Tadaoki, 4,433,403, Cl. 369-48.000.

Akanabe, Yuichi; Ikeda, Hiroaki; Maeda, Masatoshi; and Funaki, Shinsuke, to Konishiroku Photo Industry Co., Ltd. Image reading and recording apparatus and photodeflector therefor. 4,432,598, Cl. 350-6.700.

Akasaka, Kozo: *See*—
Hamamura, Kimio; Akasaka, Kozo; and Yamagishi, Youji, 4,433,159, Cl. 549-411.000.

Akers, Roy; Hartman, Charles R.; and Deutch, Keith B., to Bell & Howell Company. Mail sorting machine with improved conveyor and envelope separating device. 4,432,540, Cl. 271-8.00A.

Akita, Shigeyuki: *See*—
Kodera, Masao; and Akita, Shigeyuki, 4,433,398, Cl. 367-140.000.

Akiyama, Nobuyuki; Ohshima, Yoshimasa; and Koizumi, Mitsuyoshi, to Hitachi, Ltd. Focusing position detecting device in optical magnifying and observing apparatus. 4,433,235, Cl. 250-201.000.

Aktieselskabet de Danske Sukkerfabrikker: *See*—
Madsen, Rud F.; Nielsen, Werner K.; and Kristensen, Steen, 4,432,806, Cl. 127-48.000.

Aktieselskabet Den kongelige Porcelainsfabrik: *See*—
Poulsen, Peter, 4,433,091, Cl. 524-386.000.

Akuzawa, Noboru: *See*—
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Akzo NV: *See*—
Kersten, Hilde; Zengel, Hans G.; and Toth, Anton, 4,433,078, Cl. 523-404.000.
Wick, Gerhard, 4,433,128, Cl. 528-53.000.

Akzona Incorporated: *See*—
Worley, Ronald W.; and Johnson, David A., 4,433,135, Cl. 528-282.000.

Albany International Corp.: *See*—
Adams, Ronald W.; and Johnson, Theodore W., 4,432,822, Cl. 156-148.000.

Albers, Raymund; and Widder, Hans G., to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH. Subscriber's line circuit for telecommunications networks. 4,433,213, Cl. 179-18.0FA.

Albrecht, Leland J.; and Briere, Richard L., to High Voltage Engineering Corporation. Hotwell sampling system. 4,432,250, Cl. 73-864.340.

Aldrich, Robert G., to Halomet, Incorporated. Separation of high grade magnetite from fly ash. 4,432,868, Cl. 209-172.500.

Alexandrescu, Mircea: *See*—
Haendle, Joerg; and Alexandrescu, Mircea, 4,433,428, Cl. 378-95.000.

All-Lock Electronics, Inc.: *See*—
Korsak, Andrew J., 4,432,142, Cl. 33-174.00F.

Allemand, Charly D.: *See*—
Demers, Donald R.; and Allemand, Charly D., 4,432,644, Cl. 356-316.000.

Allen, Bernard D., Jr. Finger insert for bowling balls. 4,432,546, Cl. 273-63.00A.

Allen, David O., to Buckeye Molding Company. Container having closure panel including integrally formed scoop rupturable therefrom. 4,432,466, Cl. 220-276.000.

Allen, Michael E.: *See*—
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,433,130, Cl. 528-173.000.

Allen, William R., Sr., to Cherokee Industries, Inc. Preservation of wood. 4,433,031, Cl. 428-541.000.

Allied Corporation: *See*—
Boutros, Kamal S.; and Fenn, John W., 4,432,592, Cl. 339-103.00M.
Buyalos, Edward J.; Rowan, Hugh H.; and Young, Steven A., 4,432,940, Cl. 422-135.000.
Gualtieri, Devlin M.; Tumelty, Paul F.; and Gilleo, Mathias A., deceased, 4,433,034, Cl. 428-693.000.
Largman, Theodore; and Aharoni, Shaul M., 4,433,116, Cl. 525-420.000.
Schwark, O. Jay; and Loomba, Yogendra S., 4,432,119, Cl. 24-603.000.

Allmendinger, Thomas. Process for monitoring the history of temperature versus time of deep-frozen product, indicator for applying said process and utilization of said process. 4,432,656, Cl. 374-102.000.

Alps Electric Co., Ltd.: *See*—
Hirayama, Masaru; Anzai, Nobuaki; and Shirouzu, Ryusuke, 4,433,322, Cl. 338-162.000.

ALZA Corporation: *See*—
Shell, John W.; and Gale, Robert M., 4,432,964, Cl. 424-14.000.
Urquhart, John; and Theeuwes, Felix, 4,432,754, Cl. 604-56.000.
Urquhart, John; and Theeuwes, Felix, 4,432,756, Cl. 604-80.000.

Amada Company, Limited: *See*—
Sarurai, Nobuo; and Kobayashi, Morimasa, 4,432,260, Cl. 83-13.000.

Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, to Taisho Pharmaceutical Company, Ltd. Process for producing α-arylalkanoic acid ester. 4,433,160, Cl. 560-56.000.

Ament, Eduard: *See*—
Andres, Rudolf; and Ament, Eduard, 4,432,566, Cl. 280-807.000.

American Chemical & Engineering Co.: *See*—
Bachmann, Andrew G., 4,432,829, Cl. 156-307.300.

American Cyanamid Company: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,432,991, Cl. 424-273.00P.
Kiernan, Jane A.; and Baker, Pamela K., 4,432,995, Cl. 424-304.000.
Milionis, Jerry P.; and Fischer, Joel E., 4,432,787, Cl. 71-94.000.
Woodruff, Keith; and Villamarin, Arturo A., 4,432,102, Cl. 4-228.000.

American Hospital Supply Corporation: *See*—
Chiang, Chih-Sheng, 4,433,061, Cl. 436-542.000.

Amesso, Claudio; and Donaggio, Paolo, to Industrie Pirelli. Building block for floors and walls of a building. 4,432,177, Cl. 52-309.170.

Analytical Radiation Corporation: *See*—
Wieder, Irwin; and Wollenberg, Robert H., 4,432,907, Cl. 260-429.200.

Ancona, John A.: *See*—
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,433,233, Cl. 219-553.000.

Andersen, Phillip J., to Imperial Clevite Inc. Sintered powdered titanium alloy and method of producing same. 4,432,795, Cl. 75-245.000.

Anderson, Carl. Clamping device. 4,432,435, Cl. 182-82.000.

Anderson, David S.; and Kottke, Lawrence F., to Anko Motors, Inc. Roller assembly for peristaltic pump. 4,432,707, Cl. 417-477.000.

Andersson, Bengt; and Tanner, Olof, to Kemanord AB. Method of making foam composite material impregnated with resin. 4,432,825, Cl. 156-307.300.

Ando, Naoyoshi: *See*—
Ishii, Yoshiaki; Ando, Naoyoshi; Kume, Tsutomu; and Fujinami, Shosaku, 4,432,290, Cl. 110-346.000.

Andoh, Masamoto; Ohhori, Harumi; and Kiriyama, Takashi, to Aisin Seiki Kabushiki Kaisha. Anti-skid brake control system for motor vehicles. 4,432,586, Cl. 303-115.000.

Andre, Thierry M.: *See*—
Melchior, Jean F.; and Andre, Thierry M., 4,432,206, Cl. 60-606.000.

Andreas Stihl: *See*—
Kohler, Gisbert; Weiss, Hermann; and Landwehr, Gotz, 4,432,139, Cl. 30-381.000.

Andreassen, Knut A.; Eide, Olav A.; and Beyer, Gerhard. Diaphragm for water electrolysis. 4,432,859, Cl. 204-296.000.

Andres, Rudolf; and Ament, Eduard, to Daimler-Benz Aktiengesellschaft. Seat belt system. 4,432,566, Cl. 280-807.000.

Andrews, Harold D., to Star Packaging Corporation. Method of stretch bagging. 4,432,188, Cl. 53-436.000.

Andrillon, Patrick: *See*—
Bugaut, Andree; and Andrillon, Patrick, 4,432,769, Cl. 8-414.000.

Angel, James H.; and Aronson, Alfred L., to Cardiac Resuscitator Corporation. Cardiac arrhythmia analysis system. 4,432,375, Cl. 128-705.000.

Angelosanto, Donald J.; and Kendall, James W., to Huck Manufacturing Company. Lock spindle blind fastener for single action application. 4,432,679, Cl. 411-34.000.

Angleboard Inc.: *See*—
Liebel, Henry L., 4,432,678, Cl. 410-151.000.

Anko Motors, Inc.: *See*—
Anderson, David S.; and Kottke, Lawrence F., 4,432,707, Cl. 417-477.000.

Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, to Schering Aktiengesellschaft. Cyclocarbonate esters of 16α,17α, dihydroxy anti-inflammatory steroids. 4,432,976, Cl. 424-241.000.

ANSALDO S.p.A.: *See*—
Ripamonti, Paolo, 4,432,517, Cl. 246-28.00F.

Anzai, Nobuaki: *See*—
Hirayama, Masaru; Anzai, Nobuaki; and Shirouzu, Ryusuke, 4,433,322, Cl. 338-162.000.

Aoki, Masaki: *See*—
Azuma, Koichi; Nagasawa, Masahiro; Yamazoe, Hiroshi; and Aoki, Masaki, 4,433,408, Cl. 369-170.000.

Aoyagi, Akira; and Ikeda, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for detecting abnormal conditions of circuit breakers. 4,433,293, Cl. 324-424.000.

Aoyama, Masaharu: *See*—
Yonezawa, Toshio; and Aoyama, Masaharu, 4,433,004, Cl. 427-38.000.

Aparicio, Thomas, Jr.; and Graham, Ron, to Gratec, Inc. Adjustable powered wrench. 4,432,256, Cl. 81-57.390.

Apollo Label Company: *See*—
Jurinak, Edward L., 4,432,282, Cl. 101-350.000.

Applied Spectrum Technologies, Inc.: *See*—
Moses, Donald W.; Hustig, Charles; and Ballard, C. Ray, 4,433,212, Cl. 179-2.00C.

Aquino, Dolores C.: *See*—
Euker, Charles A., Jr.; Wesselhoft, Robert D.; Dunkleman, John J.; Aquino, Dolores C.; and Gouker, Toby R., 4,432,773, Cl. 48-197.00R.

Arai, Akira: *See*—
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.

Arai, Norimasa: *See*—
Saito, Takashi; Mochizuki, Masafumi; and Arai, Norimasa, 4,433,406, Cl. 369-77.200.

Arakawa, Yoshio: *See*—
Wakino, Kikuo; and Arakawa, Yoshio, 4,433,360, Cl. 361-305.000.

Arendash, Joseph M., to White Consolidated Industries, Inc. Vertical axis rotary loop taker. 4,432,293, Cl. 112-231.000.

Arendt, Gerhard; Benz, Roland; Engenhart, Reinhold; and Schmidt, Viktor, to Lucke Apparate-Bau GmbH. Apparatus for the continuous production and laying down of yarn loops. 4,432,501, Cl. 242-47.000.

Arendt, Hans F.: *See*—
Hoffmann, Ernst H.; and Arendt, Hans F., 4,432,111, Cl. 8-158.000.

Arens, Egidius; and Patel, Ravin, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Circuit arrangement for the formation and processing of group signals. 4,433,397, Cl. 367-122.000.

Arinc Research Corp.: *See*—
Rayburn, Joseph W., 4,433,285, Cl. 323-364.000.

Arisato, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Deflection yoke for a color cathode ray tube. 4,433,268, Cl. 313-440.000.

Arlidge, Neville J.: *See*—
Lowndes, Michael W.; Adams, Derek S.; and Arlidge, Neville J., 4,433,278, Cl. 320-48.000.

Armco Inc.: *See*—
Lawson, John E., 4,432,670, Cl. 405-224.000.

Arms, John T.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.

Armstrong World Industries, Inc.: *See*—
Addie, Lee W.; and Ollinger, James C., 4,432,182, Cl. 52-480.000.
Forry, John S.; and Garrick, John R., 4,432,714, Cl. 425-83.100.

Aronson, Alfred L.: *See*—
Angel, James H.; and Aronson, Alfred L., 4,432,375, Cl. 128-705.000.

Arro-Mac Manufacturing Inc.: *See*—
Smith, Ronald A., 4,432,106, Cl. 4-633.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Yamawaki, Maokuni; Suzuki, Shozo; and Furuta, Tadaaki, 4,432,871, Cl. 210-195.100.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Itoh, Kiyoshi; Nishikawa, Yukiyasu; Hoshika, Shuji; and Okamoto, Ikuzo, 4,432,617, Cl. 351-211.000.

Asea Aktiebolag: *See*—
Adolfsson, Morgan; Brogardh, Torgny; Goransson, Sture; and Ovren, Christer, 4,433,238, Cl. 250-227.000.

Ashihara, Yoshihiro: *See*—
Sugiyama, Masami; Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,432,896, Cl. 260-112.50R.

Ashland Oil, Inc.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Myers, George D.; and Busch, Lloyd E., 4,432,864, Cl. 208-120.000.
Myers, George D., deceased; Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., 4,432,863, Cl. 208-113.000.

Atlanta Attachment Company: *See*—
Price, Elvin C.; and Dasher, Preston B., 4,432,294, Cl. 112-262.300.

Atlantic Richfield Company: *See*—
Gupta, Vijai P.; Melpolder, Frank W.; and Mameniskis, Walter A., 4,433,173, Cl. 568-324.000.
Jester, Theresa L.; Yerkes, John W.; Gay, Charles F.; and Bottenberg, William R., 4,433,200, Cl. 136-251.000.

Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, to Robert Bosch GmbH. Electronic control system for internal combustion engines. 4,432,325, Cl. 123-491.000.

Austin Company, The: *See*—
Musto, Dominick J.; and Lerner, Harold, 4,432,648, Cl. 356-387.000.

Automobiles Citroen: *See*—
Petiot, Jean P., 4,432,740, Cl. 464-146.000.

Automotive Products Limited: *See*—
Windsor, Harry M., 4,432,445, Cl. 192-0.076.

Aviation Electric Ltd.: *See*—
Hawes, David J., 4,432,201, Cl. 60-39.161.

Azuma, Koichi; Nagasawa, Masahiro; Yamazoe, Hiroshi; and Aoki, Masaki, to Matsushita Electric Industrial Co., Ltd. Cantilever for pickup cartridge. 4,433,408, Cl. 369-170.000.

Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, to Sumitomo Chemical Company, Limited. Process for producing propylene block copolymers. 4,433,110, Cl. 525-323.000.

Baba, Sueki; Yoshida, Tomio; Akahira, Nobuo; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. Optical disc recording and retrieval system. 4,433,403, Cl. 369-48.000.

Babb, Richard B.: *See*—
Landry, James E.; and Babb, Richard B., 4,432,209, Cl. 62-62.000.

Babcock & Wilcox Company, The: *See*—
Thompson, William L.; and Willey, Michael S., 4,432,242, Cl. 73-861.220.

Bachman, Gilbert; and Heninger, Byrne, to Dittler Brothers, Inc. Cup with detachable bottom. 4,432,153, Cl. 40-324.000.

Bachmann, Andrew G., to American Chemical & Engineering Co. Adhesive bonding method. 4,432,829, Cl. 156-307.300.

Bachmann, Hans; and Frey, Robert, to Ruti Machinery Works Ltd. Filling-thread monitoring device for jet looms. 4,432,399, Cl. 139-370.200.

Bachmann, Otto. Low heat transmission framing rail structure, particularly door or window framing. 4,432,179, Cl. 52-396.000.

Bachot, Jean; and Grosbois, Jean, to Chloe Chimie. Porous diaphragm for electrolytic cell. 4,432,860, Cl. 204-296.000.

Back, Gerhard; Beffa, Fabio; and Schutz, Hans-Ulrich, to Ciba-Geigy Corporation. Sulfo-substituted fibre-reactive 1:2-chromium complex azo dyes. 4,432,898, Cl. 260-145.00A.

Bacon, James L.; and Smith, Gerald L., to International Business Machines Corporation. Photoconductor charging technique. 4,432,631, Cl. 355-3.0CH.

Badesha, Santokh S.; Smith, Thomas W.; and Loutfy, Rafik O., to Xerox Corporation. Preparation of chalcogenide alloys by electrochemical coreduction of esters. 4,432,841, Cl. 204-14.00N.

Baer, Gregory G.: *See—*
Gregory, Edward W.; and Baer, Gregory G., 4,432,420, Cl. 166-355.000.

Baessler, Konrad: *See—*
Schubert, Hans; and Baessler, Konrad, 4,433,168, Cl. 564-309.000.

Bagley, Jerry: *See—*
Riley, Thomas N.; and Bagley, Jerry, 4,432,983, Cl. 424-265.000.

Baguet, Paul R., to S.A.R.L. Commodore International. Device for controlling the opening and closing of fluidtight doors. 4,432,164, Cl. 49-209.000.

Bahn, Michael; Preuss, Wolfgang; Schmid, Rolf; and Wagner, Rudiger, to Henkel Kommanditgesellschaft auf Aktien. Simplified process for the degradation of steroid-C-22-carboxylic acids. 4,432,905, Cl. 260-397.100.

Baird Corporation: *See—*
Demers, Donald R.; and Allemand, Charly D., 4,432,644, Cl. 356-316.000.

Baker International Corporation: *See—*
Bowyer, Michael L., 4,432,417, Cl. 166-120.000.

Baker, Pamela K.: *See—*
Kiernan, Jane A.; and Baker, Pamela K., 4,432,995, Cl. 424-304.000.

Bakker, Harry J.: *See—*
Feikema, Roger H.; and Bakker, Harry J., 4,432,561, Cl. 280-281.0LP.

Balance Dynamics Co.: *See—*
Kerlin, Jack H., 4,432,253, Cl. 74-573.00R.

Balchunas, Charles A., to General Electric Company. Electric iron having stacked thermostat assembly with integral overtemperature protection control. 4,433,231, Cl. 219-253.000.

Baldyga, Joseph W., to Duraline Products Corporation. Boat hoist. 4,432,664, Cl. 405-3.000.

Ballard, C. Ray: *See—*
Moses, Donald W.; Hustig, Charles; and Ballard, C. Ray, 4,433,212, Cl. 179-2.00C.

Balzer, M. Edmond H. M. Vertical modular construction element and construction method using the same. 4,432,176, Cl. 52-293.000.

Ban, Itsuki. Remotely controllable illumination apparatus. 4,433,362, Cl. 362-86.000.

Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Method of making an ion beam sputter-etched ventricular catheter for hydrocephalus shunt. 4,432,853, Cl. 204-192.00E.

Banks, Clifford G., to Neil and Spencer Limited. Calender ironing machine with adjustable roll pressure. 4,432,149, Cl. 38-55.000.

Banks, William D.; Bond, Frank G.; and Naylor, Raymond L., to Dennison Manufacturing Company. Power supply circuitry. 4,433,251, Cl. 307-246.000.

Banner Gelatin Products Corp.: *See—*
Brown, Jack B.; and Bischoff, Wijnand J., 4,432,768, Cl. 604-200.000.

Baranczuk, Richard J. Process for preparation of control for use in estrogen receptor test. 4,433,056, Cl. 436-8.000.

Barnard, John; and Padanyi, Sandor Z. M., to Imperial Chemical Industries PLC. Process of moulding filled curable compositions. 4,432,928, Cl. 264-519.000.

Barnea, Daniel I., to Elscint, Inc. Method and apparatus for examining a body by means of penetrating radiation such as X-rays. 4,433,427, Cl. 378-146.000.

Barraclough, Paul: *See—*
Harris, Clifford J.; and Barraclough, Paul, 4,432,988, Cl. 424-273.00R.

Barry, Gerald E.: *See—*
Henkensiefken, Larry L.; Pettit, Douglas L.; and Barry, Gerald E., 4,432,499, Cl. 241-30.000.

Barta nee Szalai, Gizella: *See—*
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.

Barten, Ernst H. Rolling mill with conveying means for strip and foil materials. 4,432,221, Cl. 72-148.000.

Barth, Wayne E.; and Jasys, Vytautas J., to Pfizer Inc. Crystalline benzenesulfonate salts of sultamicillin. 4,432,987, Cl. 424-271.000.

Baschung, Michael, to Gretag Aktiengesellschaft. Apparatus for the preparation of sections of photographic film for passage through a continuous printer, particularly for processing of photographic print reorders. 4,432,637, Cl. 355-35.000.

BASF Aktiengesellschaft: *See—*
Brandstetter, Franz; Hambrecht, Juergen; and Stephan, Rudolf, 4,433,102, Cl. 525-75.000.
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,433,188, Cl. 585-640.000.
Keppler, Hans G., 4,433,108, Cl. 525-255.000.
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,433,112, Cl. 525-326.900.

Bassett, Robert F. Key concealment attachment. 4,432,219, Cl. 70-456.00R.

Batchelor, Frank R., to Beecham Group P.L.C. Pharmaceutical compositions. 4,432,969, Cl. 424-91.000.

Batchie, John M. Bomb squad training device. 4,432,731, Cl. 434-11.000.

Bates, Ronald E. Protective helmet visor. 4,432,100, Cl. 2-424.000.

Battistella, Guido: *See—*
Richelli, Angelo; and Battistella, Guido, 4,432,214, Cl. 62-341.000.

Bauer, Kurt H.; Osterwald, Hermann; Lehmann, Klaus; and Dreher, Dieter, to Rohm GmbH. Coating agent for medicaments and methods for making and using the same. 4,433,076, Cl. 523-342.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bellotti, Marc; Laurin, Dean G.; Stauber, Ronald C.; and Taylor, Larry C., 4,432,766, Cl. 604-283.000.
Estep, Timothy N., 4,432,750, Cl. 604-4.000.
Hogan, Lawrence R., 4,433,244, Cl. 250-455.100.
Mittleman, Herbert; and Boland, Gordon P., 4,432,760, Cl. 604-246.000.
Napp, E. Thomas; Stauber, R. C.; and Lillegard, Thomas R., 4,432,231, Cl. 73-290.00V.
Pearson, Stephen, 4,432,755, Cl. 604-56.000.

Bayer Aktiengesellschaft: *See—*
Findeisen, Kurt, 4,432,910, Cl. 260-545.00R.
Furstenwerth, Hauke, 4,432,897, Cl. 260-140.000.
Hombach, Rudolf; Reiff, Helmut; Wenzel, Wolfgang; and Dollhausen, Manfred, 4,433,095, Cl. 524-563.000.
Idel, Karsten; Freitag, Dieter; Bottenbruch, Ludwig; and Neuner, Otto, 4,433,138, Cl. 528-388.000.
Linhart, Karl; Gleinig, Harald; and Boehmke, Gunther, 4,432,899, Cl. 260-157.000.
Musch, Rudiger; Konter, Wolfgang; and Gobel, Wilhelm, 4,433,106, Cl. 525-215.000.
Pedain, Josef; Wellner, Wolfgang; Konig, Klaus; and Gruber, Hermann, 4,433,010, Cl. 427-160.000.
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,432,923, Cl. 264-206.000.
Rottmaier, Ludwig; and Merten, Rudolf, 4,433,085, Cl. 524-83.000.
Rottmaier, Ludwig; and Merten, Rudolf, 4,433,144, Cl. 544-198.000.
Scholl, Hans-Joachim, 4,433,169, Cl. 564-419.000.

Bayewitz, Marvin H., to Bethlehem Steel Corporation. Blast furnace control method. 4,432,790, Cl. 75-41.000.

Baylor College of Medicine: *See—*
Emery, Jared M.; and Lam, Dominic M., 4,432,751, Cl. 604-49.000.

BBC Brown, Boveri & Company, Limited: *See—*
Britsch, Helmut, 4,433,081, Cl. 523-457.000.

Beamon, Earl T.; and Bouchard, Joanne M. Word game apparatus. 4,432,554, Cl. 273-272.000.

Beausoleil, Armand S. Dispenser for rolled sheet material. 4,432,482, Cl. 226-181.000.

Beautz, Joseph A.: *See—*
Grick, Shelly J.; and Beautz, Joseph A., 4,432,099, Cl. 2-412.000.

Beaven, Paul A., to International Business Machines Corp. Interactive data retrieval apparatus. 4,433,392, Cl. 364-900.000.

Becelaere, Robert V., to Ruskin Manufacturing Company. Motor operated fire damper. 4,432,272, Cl. 98-1.000.

Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., to Ashland Oil, Inc. Immobilization of vanadia deposited on catalytic materials during carbo-metallic oil conversion. 4,432,890, Cl. 502-62.000.

Becker, Erich W.: *See—*
Wiesmann, Herbert L.; and Becker, Erich W., 4,432,582, Cl. 297-316.000.

Beckers, Jozeph H. M.; and Sipkema, Rudolf, to Stamicarbon B.V. Process for the preparation of melamine. 4,433,146, Cl. 544-201.000.

Beckman, John B.; and Blickstein, Martin J., to Abet Group, The. Peristaltic piezoelectric pump with internal load sensor. 4,432,699, Cl. 417-63.000.

Beecham Group Limited: *See—*
Ferris, Michael J., 4,432,993, Cl. 424-285.000.

Beecham Group P.L.C.: *See—*
Batchelor, Frank R., 4,432,969, Cl. 424-91.000.

Beffa, Fabio: *See—*
Back, Gerhard; Beffa, Fabio; and Schutz, Hans-Ulrich, 4,432,898, Cl. 260-145.00A.

Belanger, Inc.: *See—*
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,432,406, Cl. 160-199.000.

Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., to Belanger, Inc. Power operated bi-fold strip curtain door assembly. 4,432,406, Cl. 160-199.000.

Belcher, Samuel L.: *See—*
Wiatt, James G.; Calvert, James W.; Belcher, Samuel L.; and Smith, Roger D., 4,432,720, Cl. 425-534.000.

Bell, Barbara E. Device for the reception of leaf-shaped bodies especially of sheets of paper. 4,432,460, Cl. 211-50.000.

Bell & Howell Company: *See*—
Akers, Roy; Hartman, Charles R.; and Deutch, Keith B., 4,432,540, Cl. 271-8.00A.
Daboub, Henry A., 4,432,458, Cl. 209-564.000.
Parker, Robert R.; and Starai, Rudolph, 4,432,618, Cl. 353-25.000.

Bell Telephone Laboratories, Incorporated: *See*—
Kinsbron, Eliezer; and Lynch, William T., 4,432,132, Cl. 29-571.000.
Kollaritsch, Paul W., 4,433,331, Cl. 340-825.830.
Levy, Alvin C., 4,432,607, Cl. 350-96.340.
Schwab, Richard E., 4,432,604, Cl. 350-96.210.
Warren, Paul C., 4,433,075, Cl. 523-303.000.

Bellotti, Marc; Laurin, Dean G.; Stauber, Ronald C.; and Taylor, Larry C., to Baxter Travenol Laboratories, Inc. Conduit connectors having antiseptic application means. 4,432,766, Cl. 604-283.000.

Belozerov, Aref I.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Bendix Corporation, The: *See*—
Carp, Ralph W.; and Wright, Danny O., 4,433,390, Cl. 364-900.000.
Lewis, John, 4,433,206, Cl. 174-356.000.
Wilkinson, John R., 4,433,381, Cl. 364-431.050.

Bennington, Gerald E.: *See*—
Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., 4,432,344, Cl. 126-438.000.

Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., to Focus Environmental Systems. Method and apparatus for solar destruction of toxic and hazardous materials. 4,432,344, Cl. 126-438.000.

Benson, Gregory R.: *See*—
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, 4,432,922, Cl. 264-119.000.

Bentlage, Hans: *See*—
Rodloff, Rudiger; and Bentlage, Hans, 4,432,646, Cl. 356-350.000.

Benz, Roland: *See*—
Arendt, Gerhard; Benz, Roland; Engenhart, Reinhold; and Schmidt, Viktor, 4,432,501, Cl. 242-47.000.

Bergwerksverband GmbH: *See*—
Juntgen, Harald; Knobiauch, Karl; Reichenberger, Jurgen; and Schroter, Hans-Jurgen, 4,432,774, Cl. 55-25.000.
Schaefer, Nikolaus; Dellmann, Winfried; and Louis, Gerd, 4,432,958, Cl. 423-356.000.

Berkey Photo, Inc.: *See*—
Tarsia, Giuseppe, 4,432,636, Cl. 355-35.000.
Tarsia, Giuseppe, 4,432,638, Cl. 355-63.000.

Berkman Industries, Inc.: *See*—
Berkman, Joseph L., 4,432,453, Cl. 206-387.000.

Berkman, Joseph L., to Berkman Industries, Inc. Storage system for either boxed or unboxed cassettes. 4,432,453, Cl. 206-387.000.

Berler, Robert M. Food processor with air whipping capability. 4,432,912, Cl. 261-93.000.

Bernardin, Frederick E., Jr.: *See*—
Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., 4,432,344, Cl. 126-438.000.

Berner, Rolf E. Machine for the continuous molding of polystyrene. 4,432,713, Cl. 425-4.00C.

Berner, William E.; and Wical, Thomas H., to United States of America, Air Force. Device to measure temperature of an annular elastomeric seal. 4,433,198, Cl. 136-230.000.

Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., to MPD Technology Corporation. Hydrogen sorbent composition. 4,433,063, Cl. 502-402.000.

Bernstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,432,991, Cl. 424-273.00P.

Berrian, Donald W.; and Ward, Billy W., to Varian Associates, Inc. Pattern data handling system for an electron beam exposure system. 4,433,384, Cl. 364-525.000.

Berthold, Heinz: *See*—
Beutler, Gerhard; Berthold, Heinz; Morsch, Joachim; and Schiene, Karl, 4,432,703, Cl. 417-217.000.

Besemann, Alfred; and Rehwald, Willi, to E. C. H. Will (GmbH & Co.). Driving unit for the knife holders of cross cutters or the like. 4,432,262, Cl. 83-311.000.

Best, David W.; and Russell, Jeffrey D., to Rockwell International Corporation. Method and apparatus for testing and verifying the operability of register based state machine apparatus. 4,433,412, Cl. 371-25.000.

Best, Robert M. Cryptographic decoder for computer programs. 4,433,207, Cl. 178-22.090.

Bethlehem Steel Corporation: *See*—
Bayewitz, Marvin H., 4,432,790, Cl. 75-41.000.
Hitzrot, Henry W., Jr., 4,432,803, Cl. 106-304.000.
Rudzki, Eugene M.; Jackson, Ronald W.; and Martocci, Anthony P., 4,432,657, Cl. 374-126.000.

Betts, Robert E.; Williams, Nathan P.; and Stokes, Arnold T., to United States of America, Army. Flow-through pyrotechnic delay. 4,432,202, Cl. 60-221.000.

Beune, Joannes H.; and Marissen, Roelof H., to Wavin B.V. Pipe part with socket provided with longitudinally extending channels. 4,432,395, Cl. 138-109.000.

Beutler, Gerhard; Berthold, Heinz; Morsch, Joachim; and Schiene, Karl, to bso Steuerungstechnik GmbH Industriestrasse. Adjusting arrangement for a hydraulic pump with variable discharge flow quantity. 4,432,703, Cl. 417-217.000.

Bevan, John A., to Mallinckrodt, Inc. Radiographic scanning agent. 4,432,963, Cl. 424-1.100.

Bevans, Terry D.; and Hammer, James L. Vehicle jack. 4,432,531, Cl. 254-100.000.

Beyer, Gerhard: *See*—
Andreassen, Knut A.; Eide, Olav A.; and Beyer, Gerhard, 4,432,859, Cl. 204-296.000.

Bhate, Suresh K., to Mechanical Technology Incorporated. Free piston heat engine stability control system. 4,433,279, Cl. 322-3.000.

Bic, Jean-Claude; Brossard, Pierre C.; and Duponteil, Daniel. Modulator-demodulator for four level double amplitude modulation on quadrature carriers. 4,433,310, Cl. 332-9.00R.

Bieser, Albert H.: *See*—
Smith, Dorsey T.; Bieser, Albert H.; and Kintzinger, Warren H., 4,433,337, Cl. 343-765.000.

Bigham, Eric C., to Pfizer Inc. Bis-esters of methanediol with penicillins and penicillanic acid 1,1-dioxide. 4,432,903, Cl. 260-239.100.

Bignier Schmid-Laurent: *See*—
Wascat, Raymond, 4,432,486, Cl. 228-49.00A.

Bily, Robert R. Whey-soybean product and process for making the product. 4,432,999, Cl. 426-583.000.

Bingaman, Barrett P., to Cetec Corporation. Reel and hub lock for tape drives. 4,432,506, Cl. 242-68.300.

Bird, John M. Industrial metals costed with awauite-like synthetic nickel/iron alloys. 4,433,033, Cl. 428-682.000.

Bischofberger, Jurg; and Stalder, Herbert, to Rieter Machine Works Limited. Method for the suction removal of thread breaks and thread suction apparatus. 4,432,200, Cl. 57-304.000.

Bischoff, Wijnand J.: *See*—
Brown, Jack B.; and Bischoff, Wijnand J., 4,432,768, Cl. 604-200.000.

Bjorklund, Gary C.; and Sincerbox, Glenn T., to International Business Machines Corporation. Transmissive holographic optical element on aberrating substrate. 4,432,597, Cl. 350-3.700.

Black, Robert B. Energy conversion system. 4,432,336, Cl. 126-91.00R.

Blackburn, Neil P.: *See*—
Palmer, John P.; and Blackburn, Neil P., 4,432,684, Cl. 411-366.000.

Blair, G. Richard, to Hughes Aircraft Company. Optical fiber insensitive to temperature variations. 4,432,606, Cl. 350-96.330.

Blair Industries, Inc.: *See*—
Graetz, Herbert; and Unterreiner, Ronald C., 4,432,827, Cl. 156-245.000.

Blalock, Paul B.: *See*—
Schwartz, William C.; and Blalock, Paul B., 4,433,022, Cl. 428-158.000.

Bland, Gerald F.; and Sullivan, Donald K., to Outboard Marine Corporation. Marine propulsion device including ignition interruption means to assist transmission shifting. 4,432,734, Cl. 440-1.000.

Blasius Industries, Inc.: *See*—
Bryan, Frank T., 4,432,587, Cl. 308-6.00C.

Bley, David B.: *See*—
Sarrell, Ivan D.; Bley, David B.; and Tibbets, David W., 4,432,356, Cl. 128-75.000.

Blicher, Harold. Belt making method and apparatus. 4,432,831, Cl. 156-467.000.

Blickstein, Martin J.: *See*—
Beckman, John B.; and Blickstein, Martin J., 4,432,699, Cl. 417-63.000.

Bloom, Otis J. Compartmentalized document carrier carton. 4,432,454, Cl. 206-425.000.

Boak, Maritza G.: *See*—
De Leon, Joe R.; and Boak, Maritza G., 4,433,000, Cl. 426-599.000.

Boart International, Limited: *See*—
Hopley, Robert J.; and van der Westhuizen, Wynand J., 4,432,422, Cl. 175-61.000.

Bobolts, Elroy F.: *See*—
Pike, Robert D.; and Bobolts, Elroy F., 4,432,183, Cl. 52-533.000.

Boehm, Leah: *See*—
Susman, Sherman; Delbecq, Charles J.; Volin, Kenneth J.; and Boehm, Leah, 4,432,891, Cl. 252-518.000.

Boehmke, Gunther: *See*—
Linhart, Karl; Gleinig, Harald; and Boehmke, Gunther, 4,432,899, Cl. 260-157.000.

Boeing Company, The: *See*—
Brandon, Dorris R., 4,432,514, Cl. 244-118.500.

Boelema, Sikke J. A.: *See*—
van der Burgt, Maarten J.; Boelema, Sikke J. A.; Schoeber, Willem J. A. H.; and Zuideveld, Pieter L., 4,433,065, Cl. 518-703.000.

Boesl, Ulrich; Neusser, Hans J.; and Schlag, Edward W. Process and apparatus for determining molecule spectra. 4,433,241, Cl. 250-282.000.

Bohan, John E., Jr.; and Hinton, Brian J., to Honeywell Inc. Interrupted power hot wire gas ignition control system. 4,432,722, Cl. 431-46.000.

Bokerman, Gary N.; and Langley, Neal R., to Dow Corning Corporation. Polymerization of polydiorganosiloxane in the presence of filler. 4,433,096, Cl. 524-783.000.

Boland, Gordon P.: *See*—
Mittleman, Herbert; and Boland, Gordon P., 4,432,760, Cl. 604-246.000.

Bolon, Donald A.; and Gorczyca, Thomas B., to General Electric Company. Coating solution of polyetherimide monomers. 4,433,131, Cl. 528-185.000.

Bolton, Wilbur M.: *See*—
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,432,340, Cl. 126-390.000.

Bond, Frank G.: *See*—
Banks, William D.; Bond, Frank G.; and Naylor, Raymond L., 4,433,251, Cl. 307-246.000.

Boot, Phillip H., to Hanford Pty., Ltd. Building modules. 4,432,171, Cl. 52-79.100.

Boots Company, The: *See*—
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.

Borden Chemical Company (Canada) Limited, The: *See*—
Chiu, Shui-Tung, 4,433,120, Cl. 525-501.000.

Borman, August H.; and Perlick, Mark A., to General Motors Corporation. Hydraulic control for a power transmission. 4,432,255, Cl. 74-869.000.

Borrows, Paul K.: *See*—
Mlot-Fijalkowski, Adolf; and Borrows, Paul K., 4,433,289, Cl. 324-215.000.

Bott, John A. Vehicle article carrier. 4,432,478, Cl. 224-321.000.

Bott, Richard E.: *See*—
Muller, Max; Lilly, Eugene B.; and Bott, Richard E., 4,432,112, Cl. 15-36.000.

Bottenberg, William R.: *See*—
Jester, Theresa L.; Yerkes, John W.; Gay, Charles F.; and Bottenberg, William R., 4,433,200, Cl. 136-251.000.

Bottenbruch, Ludwig: *See*—
Idel, Karsten; Freitag, Dieter; Bottenbruch, Ludwig; and Neuner, Otto, 4,433,138, Cl. 528-388.000.

Bouchara, Emile: *See*—
Dumaitre, Bernard; Perrin, Claude; Cornu, Pierre-Jean; and Streichenberger, Gilles, 4,432,984, Cl. 424-267.000.

Bouchard, Andre C., to GTE Products Corporation. Multilamp photoflash unit with improved quick-disconnect switch. 4,432,723, Cl. 431-359.000.

Bouchard, Andre C.; and Craig, Robert F., to GTE Products Corporation. Photoflash lamp including improved ignition means. 4,432,724, Cl. 431-362.000.

Bouchard, Joanne M.: *See*—
Beamon, Earl T.; and Bouchard, Joanne M., 4,432,554, Cl. 273-272.000.

Boutros, Kamal S.; and Fenn, John W., to Allied Corporation. Electrical connector assembly. 4,432,592, Cl. 339-103.00M.

Bowyer, Michael L., to Baker International Corporation. Control pressure actuated downhole hanger apparatus. 4,432,417, Cl. 166-120.000.

Boy, Jurgen: *See*—
Lange, Gerhard; and Boy, Jurgen, 4,433,354, Cl. 361-120.000.

Boyars, Carl; and Edwards, David J., to United States of America, Air Force. Bomb blast attenuator. 4,432,285, Cl. 109-49.500.

Boyette, Lewis D. Attachment for safety valves. 4,432,383, Cl. 137-77.000.

Brader, Kurt: *See*—
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,432,174, Cl. 52-222.000.

Bradley, John J.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.

Brandon, Dorris R., to Boeing Company, The. Decompression equalization relief valve. 4,432,514, Cl. 244-118.500.

Brandstetter, Franz; Hambrecht, Juergen; and Stephan, Rudolf, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,433,102, Cl. 525-75.000.

Brannagan, James P.: *See*—
Norman, Deumite; Brannagan, James P.; and McLane, Wesley, 4,432,289, Cl. 110-336.000.

Brantley, Vanston R.; and Miller, Donald R., to United States of America, Energy. Device and method for measuring the coefficient of performance of a heat pump. 4,432,232, Cl. 73-432.00R.

Brass, Holger; Braunisch, Herbert; Disselbeck, Dieter; and Golly, Helmut, to Hoechst AG. Heat absorber. 4,432,413, Cl. 165-133.000.

Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, to Friedmann & Maier Aktiengesellschaft. Control equipment for adjusting the moment of fuel injection and/or amount of fuel supplied by a fuel injection pump, for internal combustion engines. 4,432,320, Cl. 123-357.000.

Braun, Dieter: *See*—
Schmitz, H.-Joachim; Braun, Dieter; Trodler, Dieter; and Cramer, Hugo, 4,432,196, Cl. 57-204.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Conveyor trough for a scraper chain conveyor. 4,432,448, Cl. 198-735.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,432,448, Cl. 198-735.000.

Braun, Willy, to Dulux Australia Ltd. Solvent recovery process. 4,432,837, Cl. 203-37.000.

Braunisch, Herbert: *See*—
Brass, Holger; Braunisch, Herbert; Disselbeck, Dieter; and Golly, Helmut, 4,432,413, Cl. 165-133.000.

Brazil, Eugene L. Remotely adjustable control pressure by-pass and shut-off valve. 4,432,390, Cl. 137-625.460.

Breese, John A., to Kimberly-Clark Corporation. Pulp containing hydrophilic debonder and process for its application. 4,432,833, Cl. 162-158.000.

Breneman, Warren R., to Woodford Manufacturing Company. Article handling apparatus. 4,432,692, Cl. 414-749.000.

Breslau, Alan J.; and Broad, Bernard. Means for applying topical anesthesia for use with a laryngoscope. 4,432,350, Cl. 128-10.000.

Breuers, Manfred O., to Idento-Gesellschaft fur Industrielle Kennzeichnung mbH. Marker ring installation tool. 4,432,124, Cl. 29-235.000.

Breveteam S.A.: *See*—
Tesch, Gunter, 4,433,018, Cl. 428-89.000.

Bridges, James R., to Halliburton Company. Pulsed neutron generator tube power control circuit. 4,432,929, Cl. 376-119.000.

Bridgestone Tire Company Limited: *See*—
Ogawa, Masaki; and Ikegami, Mikihiko, 4,433,094, Cl. 524-496.000.
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.

Briere, Richard L.: *See*—
Albrecht, Leland J.; and Briere, Richard L., 4,432,250, Cl. 73-864.340.

Brillantes, Bonifacio B., to Morse Boulger, Inc. Incinerator and hearth construction therefor. 4,432,287, Cl. 110-212.000.

Brisard, Patrick: *See*—
Zeitoun, Paul; and Brisard, Patrick, 4,432,966, Cl. 424-21.000.

Bristol-Myers Company: *See*—
Fleming, James S., Jr.; and Buyniski, Joseph P., 4,432,980, Cl. 424-251.000.
Kaneko, Takushi; Essery, John M.; Schmitz, Henry; and Doyle, Terrence W., 4,433,158, Cl. 549-332.000.

British Aerospace Public Limited Company: *See*—
Fellas, Christakis N., 4,433,201, Cl. 136-251.000.
Young, Robert W., 4,432,512, Cl. 244-3.220.

British Steel Corporation: *See*—
Jones, Alun, 4,432,234, Cl. 73-597.000.

Britsch, Helmut, to BBC Brown, Boveri & Company, Limited. Electrical insulation body. 4,433,081, Cl. 523-457.000.

Brittin, Craig E., to General Motors Corporation. Method of inductively heating workpieces to a uniform temperature. 4,433,227, Cl. 219-10.410.

Broad, Bernard: *See*—
Breslau, Alan J.; and Broad, Bernard, 4,432,350, Cl. 128-10.000.

Brode, George L.; and Chow, Sui-Wu, to Union Carbide Corporation. Liquid thermosetting compositions containing hemiformals of phenol. 4,433,119, Cl. 525-442.000.

Brode, George L.; and Chow, Sui-Wu, to Union Carbide Corporation. Hemi-formals of methylolated phenols. 4,433,129, Cl. 528-154.000.

Broderna Lindqvists Verkstader AB: *See*—
Johansson, Donald, 4,432,737, Cl. 440-60.000.

Brogardh, Torgny: *See*—
Adolfsson, Morgan; Brogardh, Torgny; Goransson, Sture; and Ovren, Christer, 4,433,238, Cl. 250-227.000.

Brooks, Peter L.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.

Brossard, Pierre C.: *See*—
Bic, Jean-Claude; Brossard, Pierre C.; and Duponteil, Daniel, 4,433,310, Cl. 332-9.00R.

Brown, Gilbert M.: *See*—
Hurst, Fred J.; Brown, Gilbert M.; and Posey, Franz A., 4,432,945, Cl. 423-10.000.

Brown, Jack B.; and Bischoff, Wijnand J., to Banner Gelatin Products Corp. Medicinal fluid applicator. 4,432,768, Cl. 604-200.000.

Broyles, Harry C.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.

Bruce, Kenneth E.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.

Brucher, Eberhard. Manipulator for charging devices. 4,432,252, Cl. 74-469.000.

Bruderle, Egon U.; and Wannemacher, Willibald, to Mannesmann Demag AG. Canal building apparatus. 4,432,672, Cl. 405-268.000.

Brundiek, Horst; and Werner, Ludwig, to Loesche GmbH. Roll mill for milling coal. 4,432,500, Cl. 241-57.000.

Bruninga, Kenneth J., to L. R. Nelson Corporation. Pop-up sprinkler with independently biased drain valve. 4,432,495, Cl. 239-205.000.

Brunswick Corporation: *See*—
Wrasidlo, Wolfgang J.; and Mysels, Karol J., 4,432,875, Cl. 210-500.200.

Bryan, Frank T., to Blasius Industries, Inc. Recirculating ball bearing assembly. 4,432,587, Cl. 308-6.00C.

bso Steuerungstechnik GmbH Industriestrasse: *See*—
Beutler, Gerhard; Berthold, Heinz; Morsch, Joachim; and Schiene, Karl, 4,432,703, Cl. 417-217.000.

Buchanan, Harry C., Jr.: *See*—
Longhouse, Richard E.; Cornwell, William D., Jr.; and Buchanan, Harry C., Jr., 4,433,263, Cl. 310-233.000.

Buchheit, Robert F., to Xerox Corporation. Time averaged amplitude comparison electrometer. 4,433,297, Cl. 324-457.000.

Buchmann, Rudolf C. Stackable multi-purpose heater with controllable heat action. 4,432,338, Cl. 126-256.000.

Buckeye Molding Company: *See—*
Allen, David O., 4,432,466, Cl. 220-276.000.
Buckmaster, Adrian C., to Dowty Mining Equipment Limited. Mine roof support. 4,432,673, Cl. 405-302.000.
Bugaut, Andree; and Andrillon, Patrick, to L'Oreal. Nitro dyestuffs, a process for their preparation, and use of these dyestuffs in dyeing keratin fibres. 4,432,769, Cl. 8-414.000.
Buhler, Anton; and Hug, Peter, to Sprecher & Schuh AG. High-voltage circuit breaker. 4,433,220, Cl. 200-144.0AP.
Bujan, Albert F.: *See—*
Gross, James R.; and Bujan, Albert F., 4,432,759, Cl. 604-411.000.
Bulova Watch Company, Inc.: *See—*
Hesselschwerdt, Bernhard, 4,432,654, Cl. 368-282.000.
Wollman, Jack, 4,432,655, Cl. 368-282.000.
Burghartz, Hans K.: *See—*
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,432,923, Cl. 264-206.000.
Burlington Industries, Inc.: *See—*
Schwartz, William C.; and Blalock, Paul B., 4,433,022, Cl. 428-158.000.
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Nonplanar substrate injection lasers grown in vapor phase epitaxy. 4,433,417, Cl. 372-45.000.
Burroughs Corporation: *See—*
Kay, Nicholas W., 4,433,269, Cl. 313-632.000.
Potash, Hanan, 4,433,391, Cl. 364-900.000.
York, Kenneth L.; and Stram, Oscar B., 4,433,389, Cl. 364-900.000.
Burundy, Inc.: *See—*
Wright, Howard, 4,432,519, Cl. 248-49.000.
Busch, Lloyd E.: *See—*
Myers, George D.; and Busch, Lloyd E., 4,432,864, Cl. 208-120.000.
Butterworth, Inc.: *See—*
Pacht, Amos, 4,432,386, Cl. 137-327.000.
Buyalos, Edward J.; Rowan, Hugh H.; and Young, Steven A., to Allied Corporation. Reactor. 4,432,940, Cl. 422-135.000.
Buyniski, Joseph P.: *See—*
Fleming, James S., Jr.; and Buyniski, Joseph P., 4,432,980, Cl. 424-251.000.
Byars, Larry W., to Tranoco, Inc.; and Dunlop Sports Company, div. Dunlop Tire and Rubber Corp. Golf club. 4,432,550, Cl. 273-169.000.
Bykov, Anatoly P. Apparatus for measuring deformation. 4,432,239, Cl. 73-800.000.
Cabloptic S.A.: *See—*
Falco, Lucien, 4,432,600, Cl. 350-96.180.
Cabot Corporation: *See—*
Harris, Bernard; and Klein, Howard J., 4,433,242, Cl. 250-358.100.
Cacciapuoti, Beniamino, to Moplefan S.p.A. Noiseless high-speed circular loom for producing tubular fabrics consisting of strips, threads and the like made of synthetic or natural materials. 4,432,397, Cl. 139-13.00R.
Cadars, Patrick, to Valeo. Heat exchanger, in particular for a cooling circuit of a motor vehicle engine. 4,432,410, Cl. 165-32.000.
Cadre Corporation, The: *See—*
Gitman, Grigory M., 4,432,726, Cl. 432-9.000.
Caflisch, Jerry A., to Pako Corporation. Dryer apparatus for film disc processor. 4,432,629, Cl. 354-299.000.
Caflisch, Jerry A.: *See—*
Lee, Conrad E.; and Caflisch, Jerry A., 4,432,475, Cl. 222-509.000.
Cain Encoder Co.: *See—*
Wason, Thomas D., 4,433,332, Cl. 340-870.370.
Caines, Ronald S., to Dow Chemical Co., The. Method and compressed vermicular expanded graphite apparatus for heat exchanging. 4,432,408, Cl. 165-1.000.
Callander, Keith A., to Polysar Limited. Process for preparing curable compounds. 4,433,077, Cl. 523-344.000.
Calvert, James W.: *See—*
Wiatt, James G.; Calvert, James W.; Belcher, Samuel L.; and Smith, Roger D., 4,432,720, Cl. 425-534.000.
Calvin, Douglas J.: *See—*
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,432,406, Cl. 160-199.000.
Campbell, Duncan R. J.; and Rogers, Philip J., to Pilkington P.E. Limited. Infra-red optical systems. 4,432,596, Cl. 350-1.300.
Campbell, Henry F., to William H. Rorer, Inc. Pyridone compounds. 4,432,979, Cl. 424-250.000.
Campbell, Thomas K.: *See—*
Lowell, Francis C.; and Campbell, Thomas K., 4,432,243, Cl. 73-861.310.
Can-Gun Limited: *See—*
Hutchinson, Paul; and Serginson, Alan, 4,432,474, Cl. 222-402.150.
Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government: *See—*
Wind, David W., 4,433,335, Cl. 343-463.000.
Canon Kabushiki Kaisha: *See—*
Ikemori, Keiji, 4,432,615, Cl. 350-427.000.
Sakurada, Nobuaki; Kiuchi, Masayoshi; and Thunoda, Masahiro, 4,432,628, Cl. 354-289.120.
Shirai, Masanari; and Yanagawa, Hitoshi, 4,432,509, Cl. 242-195.000.
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,432,621, Cl. 354-403.000.
Cantley, Ross H. Method and apparatus for handling a coin holder. 4,432,379, Cl. 133-1.00R.
Capell, Ronald: *See—*
Henze, Helmut; and Capell, Ronald, 4,433,009, Cl. 427-97.000.
Capots, Larry H.: *See—*
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., 4,433,286, Cl. 324-61.00R.
Caprari, Fausto; and Geshner, Robert A., to RCA Corporation. Visual defect inspection of masks. 4,432,641, Cl. 356-237.000.
Capuano, Terry D., to Russell Burdsall & Ward Corporation. Fastener. 4,432,681, Cl. 411-180.000.
Caputi, William J., Jr., to Eaton Corporation. Passive ranging system. 4,433,334, Cl. 343-450.000.
Caputo, William R.; and Nomura, Masami, to Westinghouse Electric Corp. Elevator system. 4,432,439, Cl. 187-29.00R.
Cardiac Resuscitator Corporation: *See—*
Angel, James H.; and Aronson, Alfred L., 4,432,375, Cl. 128-705.000.
Carey, Maurice E., to Fairchild Camera and Instrument Corporation. Digital tester local memory data storage system. 4,433,414, Cl. 371-27.000.
Carl Freudenberg, Firma: *See—*
Drucktenhengst, Rolf, 4,432,557, Cl. 277-153.000.
Lohmar, Ernst; and Kunkel, Hans-Achim, 4,432,580, Cl. 296-39.00A.
Pletsch, Hubert, 4,432,537, Cl. 267-8.00R.
Carlson, Albert W. D., to Rivercross Learning Corp. Amusement and educational game. 4,432,733, Cl. 434-339.000.
Carlsson, Harry, to AB Samefa. Arrangement for measuring and checking motorcycle frames. 4,432,144, Cl. 33-180.0AT.
Carnes, W. Robert. Signature verification system. 4,433,436, Cl. 382-3.000.
Caroff, Yves, to Facom. Apparatus for inspecting the geometry of the wheels of a vehicle. 4,432,145, Cl. 33-288.000.
Carol Cable Company, Inc.: *See—*
Waluk, Stanley P., 4,432,593, Cl. 339-105.000.
Carollo, James A.; and Kalinsky, Wayne A., to Rockwell International Corporation. Battery charging system. 4,433,277, Cl. 320-24.000.
Carp, Ralph W.; and Wright, Danny O., to Bendix Corporation, The. Power processing reset system for a microprocessor responding to sudden deregulation of a voltage. 4,433,390, Cl. 364-900.000.
Carr, Alan R., to United States of America, Commerce. Three-element antenna formed of orthogonal loops mounted on a monopole. 4,433,336, Cl. 343-728.000.
Carre, Paul: *See—*
Castagner, Bernard; Carre, Paul; and Moise, Gervais, 4,432,269, Cl. 89-1.816.
Carrier Corporation: *See—*
Fraser, Bruce A.; and Holt, Curtis, Jr., 4,432,705, Cl. 417-295.000.
Carruthers, James D.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Carter, George B.; and Cross, Alan, to Imperial Metal Industries (Ky-noch) Limited. Priming composition and techniques. 4,432,819, Cl. 149-45.000.
Cassiere, Gerald D., to Chamberlain Manufacturing Corporation. Adjustable mounting system for patio doors and the like. 4,432,163, Cl. 49-63.000.
Cassou, Bertrand; Cassou, Maurice; and Cassou, Robert. Apparatus for artificial insemination. 4,432,753, Cl. 604-55.000.
Cassou, Maurice: *See—*
Cassou, Bertrand; Cassou, Maurice; and Cassou, Robert, 4,432,753, Cl. 604-55.000.
Cassou, Robert: *See—*
Cassou, Bertrand; Cassou, Maurice; and Cassou, Robert, 4,432,753, Cl. 604-55.000.
Castagner, Bernard; Carre, Paul; and Moise, Gervais, to Societe d'E-tudes, de Realisations et d'Applications Techniques (S.E.R.A.T.). Weapon system. 4,432,269, Cl. 89-1.816.
Castle, Richard B.: *See—*
Kuykendall, Charles R.; and Castle, Richard B., 4,432,172, Cl. 52-98.000.
Casu, Benito: *See—*
Tegiacchi, Fabio; Chiruzzi, Mario; Casu, Benito; and Torri, Giangiacomo, 4,432,801, Cl. 106-92.000.
Catelli, Camillo, to Rossi & Catelli S.p.A. Contrivance for heating, pasteurizing and sterilizing fluid foodstuffs. 4,432,276, Cl. 99-453.000.
Caterpillar Mitsubishi Limited: *See—*
Yamamoto, Kazuyoshi; and Sato, Tadashi, 4,432,257, Cl. 81-464.000.
Caterpillar Tractor Co.: *See—*
Rice, Stuart L., 4,432,812, Cl. 148-36.000.
Censor Patent-und Versuchs-Anstalt: *See—*
Mayer, Herbert E., 4,432,635, Cl. 355-30.000.
Centre National d'Etudes et d'Experimentation de Machinisme Agricole: *See—*
Lucas, Jean; and Sylla, Lancine, 4,432,342, Cl. 126-418.000.
Cessna Aircraft Company, The: *See—*
Jackson, Alan D.; and Day, Kenneth E., 4,432,389, Cl. 137-469.000.
Cetec Corporation: *See—*
Bingaman, Barrett P., 4,432,506, Cl. 242-68.300.
Cetronio, Antonio, to Selenia Industrie Elettroniche Associate S.p.A. Process for oxidizing semiconducting compounds, especially gallium arsenide. 4,433,006, Cl. 427-39.000.
Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc S.A. Sulphones having a 1,5-dimethyl-hexa-1,5-dienylene group. 4,433,171, Cl. 568-33.000.
Chamberlain Manufacturing Corporation: *See—*
Cassiere, Gerald D., 4,432,163, Cl. 49-63.000.

Champion International Corporation: *See*—
Cote, Raymond A., 4,432,489, Cl. 229-22.000.
Dutcher, Daniel P., 4,432,488, Cl. 229-21.000.
Roberts, Harry H., 4,432,490, Cl. 229-22.000.
Thompson, Kenneth P., 4,432,820, Cl. 156-82.000.
Champion Spark Plug Company: *See*—
Nemeth, Joseph, 4,433,092, Cl. 524-414.000.
Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., to Pharmindustrie. 2-(4-Piperidyl)-1-(4-quinolyl)-ethanones and ethanes. 4,433,150, Cl. 546-168.000.
Chandler, Joe D.: *See*—
Knorr, Raymond S.; Chandler, Joe D.; and Tran, Loi N., 4,433,122, Cl. 526-83.000.
Chang, Chi-Deu; and Graham, Henry A., Jr., to Ortho Diagnostic Systems Inc. Double antibody conjugate. 4,433,059, Cl. 436-512.000.
Chao, James C.: *See*—
Huibers, Derk T. A.; Chao, James C.; and Shah, Rajni C., 4,433,184, Cl. 568-863.000.
Chapman, Gerda L. Therapeutic leg support. 4,432,108, Cl. 5-443.000.
Chattanooga Corporation: *See*—
Sarrell, Ivan D.; Bley, David B.; and Tibbets, David W., 4,432,356, Cl. 128-75.000.
Chemische Werke Huels, A.G.: *See*—
Kaufhold, Manfred, 4,433,175, Cl. 568-471.000.
Chemische Werke Huls AG: *See*—
Kupper, Friedrich-Wilhelm; Padberg, Gunter; Reichert, Ulrich; and Trautmann, Walter, 4,433,099, Cl. 525-53.000.
Chen, Peter Y. S.; Helmer, Wayne A.; and Rosen, Howard N., to United States of America, Agriculture. Energy efficient lumber dry kiln using solar collectors and refrigeration system. 4,432,147, Cl. 34-46.000.
Chen, Richard M. Golfer's training aid. 4,432,551, Cl. 273-183.00C.
Chen, Yung J.: *See*—
McNeill, William H.; and Chen, Yung J., 4,432,614, Cl. 350-386.000.
Cheng, Wei-Min: *See*—
Liau, Shung-Chung; Cheng, Wei-Min; and Young, Uen-Long, 4,432,840, Cl. 204-14.00N.
Chernik, Jury S.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.
Cherokee Industries, Inc.: *See*—
Allen, William R., Sr., 4,433,031, Cl. 428-541.000.
Chevron Research Company: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,432,949, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,432,953, Cl. 423-140.000.
Loh, William, 4,432,786, Cl. 71-90.000.
Streib, Stephen F., 4,433,329, Cl. 340-606.000.
Wallman, P. Henrik, 4,432,861, Cl. 208-11.00R.
Chew, Ivan; and Verhaeg, John, to Yale Security Products Ltd. Electronic locks for doors. 4,433,355, Cl. 361-172.000.
Chiang, Chih-Sheng, to American Hospital Supply Corporation. Radioimmunoassay for cyclic nucleotides. 4,433,061, Cl. 436-542.000.
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, to Tanabe Seiyaku Co., Ltd. Enzymatic active substance immobilized in a polysaccharide gel matrix. 4,433,054, Cl. 435-178.000.
Chicago Fluid Power Corp.: *See*—
Mills, Carl R., 4,432,393, Cl. 138-30.000.
Chino, Koichi: *See*—
Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, 4,432,894, Cl. 252-632.000.
Chirouze, Jean L.: *See*—
Raisin, Jean-Pierre; Helffer, Bernard; and Chirouze, Jean L., 4,432,295, Cl. 112-262.300.
Chiruzzi, Mario: *See*—
Tegiacchi, Fabio; Chiruzzi, Mario; Casu, Benito; and Torri, Giangiacomo, 4,432,801, Cl. 106-92.000.
Chiu, Shui-Tung, to Borden Chemical Company (Canada) Limited, The. Liquid phenolic resin composition and method for waferboard manufacture. 4,433,120, Cl. 525-501.000.
Chloe Chimie: *See*—
Bachot, Jean; and Grosbois, Jean, 4,432,860, Cl. 204-296.000.
Chloff, Gunther: *See*—
Fehr, Charles; and Chloff, Gunther, 4,433,183, Cl. 568-829.000.
Choi, Hak-Ki, to Samsung Electronics Co., Ltd. Power supply circuit for a variable electrical source. 4,433,368, Cl. 363-45.000.
Chow, Sui-Wu: *See*—
Brode, George L.; and Chow, Sui-Wu, 4,433,119, Cl. 525-442.000.
Brode, George L.; and Chow, Sui-Wu, 4,433,129, Cl. 528-154.000.
Christensen, James M.; and Mizoguchi, Allan H., to Sutter Biomedical Inc. Portable continuously self-monitoring bone healing device and method. 4,432,361, Cl. 128-419.00F.
Chu, Chin-Chiun, to Mobil Oil Corporation. Catalysts for para-ethyltoluene dehydrogenation. 4,433,186, Cl. 585-445.000.
Chugai Denki Kogyo Kabushiki Kaisha: *See*—
Shibata, Akira, 4,432,487, Cl. 228-194.000.
Chumbley, James F. Insulative fabric. 4,433,019, Cl. 428-110.000.
Churcher, Dale L.: *See*—
Novoselac, John; and Churcher, Dale L., 4,432,748, Cl. 494-2.000.
Chye, Patrick W.; Hearn, Eric W.; Kulkarni, Murlidhar V.; and Markovits, Gary, to International Business Machines Corporation. Method for reducing oxygen precipitation in silicon wafers. 4,432,809, Cl. 148-1.500.
Ciba-Geigy Corporation: *See*—
Back, Gerhard; Beffa, Fabio; and Schutz, Hans-Ulrich, 4,432,898, Cl. 260-145.00A.
Deiner, Hans; and Sandner, Bernhard, 4,433,027, Cl. 428-260.000.
Lohse, Friedrich; and Monnier, Charles E., 4,433,179, Cl. 568-664.000.
Meyer, Hans R., 4,432,886, Cl. 252-301.270.
Pfeifer, Josef, 4,433,137, Cl. 528-348.000.
Spivack, John D., 4,433,087, Cl. 524-117.000.
CII Honeywell Bull: *See*—
Vallet, Philippe M. A.; and Vinot nee Ricol, Annie M. M., 4,433,327, Cl. 340-347.0DD.
Cincinnati Milacron Inc.: *See*—
Cunningham, Carole S.; Linser, Charles M.; Resnick, Brian J.; and Tarvin, Ronald L., 4,433,382, Cl. 364-474.000.
Wiatt, James G.; Calvert, James W.; Belcher, Samuel L.; and Smith, Roger D., 4,432,720, Cl. 425-534.000.
Cinderey, Michael B.: *See*—
Rose, John B.; and Cinderey, Michael B., 4,433,172, Cl. 568-319.000.
Cioca, Gheorghe, to Seton Company. Surface active agents based on polypeptides. 4,432,888, Cl. 252-354.000.
Circle V, Inc.: *See*—
Vernese, Michael P., 4,432,305, Cl. 119-98.000.
Clark Equipment Company: *See*—
Malott, Theodore A., 4,432,251, Cl. 74-337.500.
Robinson, Richard H., Jr., 4,432,438, Cl. 187-9.00E.
Clark, James R.; and Reeves, Michael K., to Seattle Manufacturing Corporation. Ice axe. 4,432,404, Cl. 145-2.00R.
Clark, Robert F.; and Smythe, Hugh A. Neck support rest. 4,432,107, Cl. 5-436.000.
Clark, William D.; Garner, Mark D.; Rhodes, John H., Jr.; and Wilzbach, Bernard L., to International Business Machines Corporation. Recirculating document feed apparatus and method for aligning documents therein. 4,432,541, Cl. 271-251.000.
Clark, William D. K.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.
Clavin, Harold D. Cosmetic tape and method. 4,432,347, Cl. 128-1.00R.
Clay, Eugene J.: *See*—
Pechacek, Raymond E.; and Clay, Eugene J., 4,432,128, Cl. 29-429.000.
Claypool, James L.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.
Clement, Albrecht: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Clements, Aynon L. Method and apparatus for disposing of animal waste. 4,432,498, Cl. 241-21.000.
Clements, Harold J., to Modern Precision Engineers and Associates Limited. Air-cushion apparatus. 4,432,429, Cl. 180-127.000.
Cline, Jack B. Motorcycle jack stand. 4,432,562, Cl. 280-300.000.
Coal Industry (Patents) Limited: *See*—
Parkinson, Michael J.; Jury, Anthony W.; Syred, Nicholas; and Owen, Ieuan, 4,432,778, Cl. 55-212.000.
Cobe Laboratories, Inc.: *See*—
Lobdell, Donn D.; and Goyne, Thomas E., 4,432,767, Cl. 604-86.000.
Coca Cola Company: *See*—
De Leon, Joe R.; and Boak, Maritza G., 4,433,000, Cl. 426-599.000.
Coffey, James P.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., to Imperial Chemical Industries PLC. Compositions of melt-processable polymers having improved processability. 4,433,083, Cl. 524-27.000.
Cohen, Noal; and Weber, Giuseppe, to Hoffmann-La Roche Inc. Inhibitors of SRS-synthesis. 4,432,906, Cl. 260-410.90R.
Coldren, Margaret E. Tack box and saddle rack unit. 4,432,459, Cl. 211-13.000.
Cole, Billy W.: *See*—
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Cole, Billy W., 4,432,311, Cl. 123-90.670.
Cole National Corporation: *See*—
Schultz, James R.; Smith, Francis E.; and Jurecki, Ralph J., 4,432,169, Cl. 51-424.000.
Colgate-Palmolive Company: *See*—
Hayes, Harry, 4,432,471, Cl. 222-136.000.
Collignon, Gerard: *See*—
Saint, Jacques; and Collignon, Gerard, 4,433,313, Cl. 333-109.000.
Combustion Engineering, Inc.: *See*—
Wentzell, Timothy H.; and Innes, Charles B., Jr., 4,432,271, Cl. 91-527.000.
Commissariat a l'Energie Atomique: *See*—
Ginisty, Claude; Marteau, Michel; and Mauborgne, Bernard, 4,432,946, Cl. 423-10.000.
Commonwealth of Australia, The: *See*—
Smith, Ralph N., 4,432,299, Cl. 116-137.00R.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Vinot, Daniel R., 4,433,375, Cl. 364-200.000.
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., to Intertec Associates Inc. Energy saving heating vessel. 4,432,340, Cl. 126-390.000.
Conarroe, John L., Jr.: *See*—
Patel, Vipin N.; and Conarroe, John L., Jr., 4,433,342, Cl. 357-2.000.
Conchemco Incorporated: *See*—
Schmitt, Larry D., 4,432,191, Cl. 56-11.800.
Conoco Inc.: *See*—
Mack, Mark P., 4,433,123, Cl. 526-139.000.
Yang, Kang; and Reedy, James D., 4,433,196, Cl. 585-823.000.
Consolidated Foods Corporation: *See*—
Martini, Jeanne M., 4,432,364, Cl. 128-484.000.
Conway, John W.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.
Conwed Corporation: *See*—
Huspeni, Paul J., 4,432,109, Cl. 5-478.000.
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., to Raychem Corporation. Method for internal pipe protection. 4,432,824, Cl. 156-165.000.
Coon, Clifford L.: *See*—
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,432,902, Cl. 260-239.0HM.
Cooper, David G.: *See*—
Zajic, James E.; and Cooper, David G., 4,432,887, Cl. 252-331.000.
Cooperatieve Vereniging "Verenigde Bloemenveilingen Aalsmeer" (V.B.A.) W.A.: *See*—
de Bruin, Peter, 4,432,161, Cl. 47-41.00R.
Coordes, Heinz; and Oberbach, Manfred, to Didier-Werke AG. Molten iron containing vessel with improved refractory lining. 4,432,536, Cl. 266-280.000.
Coran, Aubert Y.; and Trivette, Chester D., Jr., to Monsanto Company. Diene rubber and method and composition for rubber treatment. 4,433,114, Cl. 525-332.600.
Cordis Corporation: *See*—
Leckrone, Michael E.; and Martucci, James P., 4,432,362, Cl. 128-419.0PG.
Margules, Gary S., 4,432,366, Cl. 128-635.000.
Mumford, Van E.; Sasmor, Louis; and Schroeppel, Edward A., 4,432,360, Cl. 128-419.0PG.
Cornelius, Edward B.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Corning France: *See*—
Zarzycki, Jerzy W.; Prassas, Michel; and Phalippou, Jean E. H., 4,432,956, Cl. 423-338.000.
Corning Glass Works: *See*—
Courbin, Philippe L. P.; and Mazeau, Jean P., 4,433,062, Cl. 501-44.000.
Fehlner, Francis P.; and Wein, William J., 4,432,852, Cl. 204-181.00F.
Painley, Robert J., 4,432,918, Cl. 264-43.000.
Cornu, Pierre-Jean: *See*—
Dumaitre, Bernard; Perrin, Claude; Cornu, Pierre-Jean; and Streichenberger, Gilles, 4,432,984, Cl. 424-267.000.
Cornwell, William D., Jr.: *See*—
Longhouse, Richard E.; Cornwell, William D., Jr.; and Buchanan, Harry C., Jr., 4,433,263, Cl. 310-233.000.
Cosper, David R.: *See*—
Whitfield, Joyce M.; and Cosper, David R., 4,432,834, Cl. 162-158.000.
Cote, Raymond A., to Champion International Corporation. Pie carton. 4,432,489, Cl. 229-22.000.
Courbin, Philippe L. P.; and Mazeau, Jean P., to Corning Glass Works. Moldable fluorophosphate glasses containing Nb_2O_5. 4,433,062, Cl. 501-44.000.
Coussement, Marc: *See*—
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,951, Cl. 423-89.000.
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,952, Cl. 423-89.000.
Couturier, Guy D., to United States of America, Air Force. Sobel edge extraction circuit for image processing. 4,433,438, Cl. 382-41.000.
Cowles, Dean S., to General Instrument Corporation. Keytop levelling mechanism. 4,433,225, Cl. 200-340.000.
Cox, Gordon F. N.; and Nolte, Kenneth G., to Standard Oil Company (Indiana). Ice island construction. 4,432,669, Cl. 405-217.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc. 4-[5(and 4)-Substituted-2-thienyl]-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,432,992, Cl. 424-274.000.
Craig, Robert F.: *See*—
Bouchard, Andre C.; and Craig, Robert F., 4,432,724, Cl. 431-362.000.
Cramer, Hugo: *See*—
Schmitz, H.-Joachim; Braun, Dieter; Trodler, Dieter; and Cramer, Hugo, 4,432,196, Cl. 57-204.000.
Croon & Lucke Maschinenfabrik GmbH & Co. KG: *See*—
Wedler, Klaus, 4,432,503, Cl. 242-47.000.
Cross, Alan: *See*—
Carter, George B.; and Cross, Alan, 4,432,819, Cl. 149-45.000.
Crossman, Richard L., to Goodyear Aerospace Corporation. Electrically actuated aircraft brakes. 4,432,440, Cl. 188-71.200.
Cudmore, Patrick J. Hydrofoil sailing craft. 4,432,298, Cl. 114-39.000.
Cunningham, Carole S.; Linser, Charles M.; Resnick, Brian J.; and Tarvin, Ronald L., to Cincinnati Milacron Inc. Apparatus for automatically adjusting the programmed location of a robot arm. 4,433,382, Cl. 364-474.000.
Currer, John T., to Kearney & Trecker Corporation. Controllable tool feeding apparatus. 4,432,258, Cl. 82-1.200.
Curtis, Bernard J.: *See*—
Meyer, Wolfgang H.; and Curtis, Bernard J., 4,433,044, Cl. 430-271.000.
Cyclonaire Corporation: *See*—
Jacobson, Wayne M.; and Quaintance, Roger L., 4,432,676, Cl. 406-39.000.
Daar, Horst: *See*—
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.
Daboub, Henry A., to Bell & Howell Company. Electronic control system for monitoring and controlling the movement of an envelope through a mail sorting machine. 4,432,458, Cl. 209-564.000.
Daenen, Robert H. C. M., to Dart Industries Inc. Picture frame arrangement. 4,432,152, Cl. 40-152.100.
Daggett, Charles W., to Littelfuse, Inc. Clip-together interconnection busing clip for multiple fuse holder arrays. 4,432,594, Cl. 339-258.00F.
D'Agnolo, Armando, to Officine Savio S.p.A. Device for conveying cops. 4,432,198, Cl. 57-276.000.
Dahms, Francis A., to Emhart Industries, Inc. Glassware forming apparatus. 4,432,783, Cl. 65-239.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Goto, Sumio; Doi, Takeshi; and Sato, Kazuo, 4,433,017, Cl. 528-45.000.
Daido-Maruta Finishing Co., Ltd.: *See*—
Ishikawa, Norio; Murayama, Morio; and Nishijima, Yasumoto, 4,432,920, Cl. 264-49.000.
Daido Metal Co. Ltd.: *See*—
Iijima, Yoshio, 4,432,122, Cl. 29-156.50A.
Daimler-Benz Aktiengesellschaft: *See*—
Andres, Rudolf; and Ament, Eduard, 4,432,566, Cl. 280-807.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,432,613, Cl. 350-358.000.
Daiwa Can Company, Limited: *See*—
Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, 4,433,229, Cl. 219-84.000.
D'Amico, John J., to Monsanto Company. N-Substituted-oxobenzothiazoline derivatives useful as plant growth regulants. 4,432,785, Cl. 71-90.000.
Danfoss A/S: *See*—
Hansen, Christian B., 4,432,709, Cl. 418-61.00B.
Hansen, Christian B.; and Flagstad, Carl O., 4,432,710, Cl. 418-61.00B.
Kyster, Erik; and Thomsen, Svend E., 4,432,270, Cl. 91-436.000.
Darbonne, Hubert: *See*—
Darbonne, Luc; and Darbonne, Hubert, 4,432,148, Cl. 34-58.000.
Darbonne, Luc; and Darbonne, Hubert. Continuously operating hydro-extractor. 4,432,148, Cl. 34-58.000.
D'Arcy, James A., to Dejon Corporation. Page manipulation apparatus in apparatus for automatically turning pages. 4,432,154, Cl. 40-531.000.
Dart Industries Inc.: *See*—
Daenen, Robert H. C. M., 4,432,152, Cl. 40-152.100.
Dasher, Preston B.: *See*—
Price, Elvin C.; and Dasher, Preston B., 4,432,294, Cl. 112-262.300.
Datapoint Corporation: *See*—
Palm, Charles S., 4,433,298, Cl. 324-457.000.
Dauber, Louis S.: *See*—
Swart, Gerrit S.; Dauber, Louis S.; and O'Connor, Richard P., 4,432,862, Cl. 208-64.000.
Daumer, Rolf: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Daussan, Andre: *See*—
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,432,396, Cl. 138-109.000.
Daussan et Compagnie: *See*—
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,432,396, Cl. 138-109.000.
Daussan, Gerard: *See*—
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,432,396, Cl. 138-109.000.
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, to Daussan et Compagnie. Casting tube. 4,432,396, Cl. 138-109.000.
David, Constant V. Human propelled buoyant annular float with removable pontoon stabilizer. 4,432,735, Cl. 440-21.000.
David, Guy A. J., to U.S. Philips Corporation. Arrangement for reducing the noise in a speech signal mixed with noise. 4,433,435, Cl. 381-94.000.
Davies, Robert B.; and Miller, Ira, to Motorola, Inc. Amplifier with independent quiescent output voltage control. 4,433,302, Cl. 330-257.000.

Davis, Lewis B., Jr.; and Steber, Charles E., to General Electric Company. Modular catalytic combustion bed support system. 4,432,207, Cl. 60-723.000.

Davis, Richard C., Jr. Indwelling urethral catheter. 4,432,757, Cl. 604-99.000.

Davis, Samuel H. Retainer gland for mechanical joint pipe. 4,432,571, Cl. 285-283.000.

Davis, William M., to William P. Poythress & Company. Method for dilating the smooth muscles of the upper urinary tract. 4,432,977, Cl. 424-248.500.

Dawe, Garfield A., to Abbott Laboratories. Volumetric drop detector. 4,432,761, Cl. 604-253.000.

Dawe, Garfield A., to Abbott Laboratories. Volumetric drop detector. 4,432,762, Cl. 604-253.000.

Day, Kenneth E.: *See*—
Jackson, Alan D.; and Day, Kenneth E., 4,432,389, Cl. 137-469.000.

Dean, Frank J., Jr., to Tempmaster Corporation. Sound absorbing arrangement for air handling units. 4,432,434, Cl. 181-225.000.

Dearborn Chemicals, Ltd.: *See*—
Greaves, Brian; and Ingham, Paul, 4,432,879, Cl. 210-699.000.

DeArment, Donald K.: *See*—
Zekert, Gerhard C.; and DeArment, Donald K., 4,432,275, Cl. 99-625.000.

de Bruin, Peter, to Cooperatieve Vereniging "Verenigde Bloemenveilingen Aalsmeer" (V.B.A.) W.A. Receptacle for cut flowers. 4,432,161, Cl. 47-41.00R.

DeCandia, Giovanni: *See*—
Shelby, Billy L.; and DeCandia, Giovanni, 4,433,367, Cl. 362-370.000.

Deere & Company: *See*—
Hutchison, Wayne R.; and Meylink, John G., 4,432,309, Cl. 123-41.660.

DeFelsko Corporation: *See*—
Koch, Frank, 4,433,290, Cl. 324-230.000.

De Gasperi, Mario M.; Racciu, Antonio; and Nari, Dario, to Tasco S.p.A. Method and apparatus for real time detection of faults in industrial objects. 4,433,385, Cl. 364-554.000.

de Gracia, Maria R. Chemical reagent indicator for the in vitro diagnosis of pregnancy. 4,433,057, Cl. 436-65.000.

DeGraw, Joseph I., Jr.; and Sirotnak, Francis M. Process for preparing 10-deazaminopterins. 4,433,147, Cl. 544-260.000.

DeHaan, Dennis A., to Procter & Gamble Company, The. Web segmenting apparatus. 4,432,746, Cl. 493-359.000.

De Haas, Franciscus C. M.: *See*—
Van Roosmalen, Johannes H. T.; and De Haas, Franciscus C. M., 4,432,738, Cl. 445-34.000.

Deiner, Hans; and Sandner, Bernhard, to Ciba-Geigy Corporation. Process for finishing textiles with alkoxylation products, and compositions for this. 4,433,027, Cl. 428-260.000.

de Jaeger, Bogena, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Method and apparatus for detecting the training sequence for a self-adapting equalizer. 4,433,425, Cl. 375-113.000.

Dejon Corporation: *See*—
D'Arcy, James A., 4,432,154, Cl. 40-531.000.

Delbecq, Charles J.: *See*—
Susman, Sherman; Delbecq, Charles J.; Volin, Kenneth J.; and Boehm, Leah, 4,432,891, Cl. 252-518.000.

De Leon, Joe R.; and Boak, Maritza G., to Coca Cola Company. Method for preventing separation in fruit juice-containing products. 4,433,000, Cl. 426-599.000.

Dellmann, Winfried: *See*—
Schaefer, Nikolaus; Dellmann, Winfried; and Louis, Gerd, 4,432,958, Cl. 423-356.000.

Delluc, Rene. Hydromechanical massaging device. 4,432,355, Cl. 128-56.000.

Delphian Corporation: *See*—
Typpo, Pekka M., 4,432,224, Cl. 73-23.000.

DeLuca, Raymond F., to Georgia-Pacific Corporation. Severing web plies in multiple roll material dispensers. 4,432,261, Cl. 83-37.000.

De Marco, Giuliano; and Gemi, Roberto, to Ing. C. Olivetti & C., S.p.A. Device for recording and/or reading binary data on both faces of a flexible magnetic disk. 4,433,352, Cl. 360-105.000.

Demers, Donald R.; and Allemand, Charly D., to Baird Corporation. Spectrometer. 4,432,644, Cl. 356-316.000.

Dempster, Philip T. Method and apparatus for measuring gaseous oxygen. 4,432,226, Cl. 73-27.00A.

Denmark, James; and Shilcock, John. Carriers for containers. 4,432,579, Cl. 294-87.200.

Dennison Manufacturing Company: *See*—
Banks, William D.; Bond, Frank G.; and Naylor, Raymond L., 4,433,251, Cl. 307-246.000.

Denzine, Allen F.; and Thurber, William E. F., Jr., to Resistic Materials Inc. Seal with teflon or rubber. 4,432,883, Cl. 252-12.000.

DeReggi, Aime' S.; and Harris, Gerald R., to United States of America, Health and Human Services. Acoustically transparent hydrophone probe. 4,433,400, Cl. 367-163.000.

De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Process for separating germanium from an aqueous solution. 4,432,951, Cl. 423-89.000.

De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Process for separating germanium from an aqueous solution by means of an alphahydroxyoxime. 4,432,952, Cl. 423-89.000.

DeSoto, Inc.: *See*—
Gaske, Joseph E.; and Pennanen, Hannu K., 4,433,014, Cl. 427-380.000.

Dettling, Joseph C.: *See*—
Eleazar, Antonio E.; Heck, Ronald M.; Dettling, Joseph C.; and Lui, Yiu-Kwan, 4,433,191, Cl. 585-671.000.

Deutch, Keith B.: *See*—
Akers, Roy; Hartman, Charles R.; and Deutch, Keith B., 4,432,540, Cl. 271-8.00A.

Deutsch Fastener Corp.: *See*—
Molina, Jorge W., 4,432,680, Cl. 411-103.000.

Deutsch, James W., to University of California, The Regents of the. Membrane receptor assay. 4,433,058, Cl. 436-504.000.

Deutsche Forschungs-und Versuchsanstalt fur Luft- und Raumfahrt E.V.: *See*—
Rodloff, Rudiger; and Bentlage, Hans, 4,432,646, Cl. 356-350.000.
Schmidt, Dieter; and Engler, Rolf, 4,432,237, Cl. 73-632.000.

Devitt, Gerald J., to Revere Products Corporation. Fan powered roof venting method and apparatus. 4,432,273, Cl. 98-43.00C.

Diamond Shamrock Corporation: *See*—
Kline, George A., 4,432,839, Cl. 204-12.000.

Diazzi, Mauro. Process of molding and assembling a pair of handles of a plastic bag. 4,432,127, Cl. 29-436.000.

Dickhudt, Eugene A., to Medtronic, Inc. Biomedical lead with ring electrode and method of making same. 4,432,377, Cl. 128-786.000.

Didier Engineering GmbH: *See*—
Hackler, Erich; Flockenhaus, Claus; and Lommerzheim, Werner, 4,433,066, Cl. 518-706.000.

Didier-Werke AG: *See*—
Coordes, Heinz; and Oberbach, Manfred, 4,432,536, Cl. 266-280.000.

Dierkes, Heribert: *See*—
Minning, Rudolf; and Dierkes, Heribert, 4,432,123, Cl. 29-157.00A.

Diesel, Nelson P. Apparatus for affixing marker to fabric. 4,432,301, Cl. 118-315.000.

Dietz, Henry G. Differential pressure switch with square diaphragm plate supported by the diaphragm. 4,433,219, Cl. 200-83.00R.

Director-General of Agency of Industrial Science & Technology: *See*—
Hiratani, Kazuhisa, 4,433,151, Cl. 546-178.000.

Discovision Associates: *See*—
Golding, Scott M., 4,433,423, Cl. 375-30.000.

Disselbeck, Dieter: *See*—
Brass, Holger; Braunisch, Herbert; Disselbeck, Dieter; and Golly, Helmut, 4,432,413, Cl. 165-133.000.

Dittler Brothers, Inc.: *See*—
Bachman, Gilbert; and Heninger, Byrne, 4,432,153, Cl. 40-324.000.

Dr. Johannes Heidenhain GmbH: *See*—
Miller, Walter, 4,433,373, Cl. 364-171.000.

Dr. Karl Thomae GmbH: *See*—
Seliger, Hartmut; Rastl, Eva; and Swetly, Peter, 4,433,140, Cl. 536-27.000.

Dr. Otto Suwelack NACHF. GmbH & Co.: *See*—
Reimerdes, Ernst H., 4,432,997, Cl. 426-7.000.

Doi, Motomichi: *See*—
Nii, Katsutoshi; Okano, Kinpei; Doi, Motomichi; and Kitsuya, Minoru, 4,433,432, Cl. 378-193.000.

Doi, Takeshi: *See*—
Goto, Sumio; Doi, Takeshi; and Sato, Kazuo, 4,433,017, Cl. 528-45.000.

Doleschall, Gabor: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Vizky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.

Dolikian, Arman V., to Motorola, Inc. Limiter with dynamic hysteresis. 4,433,256, Cl. 307-358.000.

Dollhausen, Manfred: *See*—
Hombach, Rudolf; Reiff, Helmut; Wenzel, Wolfgang; and Dollhausen, Manfred, 4,433,095, Cl. 524-563.000.

Dominguez, Richard J. G.: *See*—
Rice, Doris M.; and Dominguez, Richard J. G., 4,433,067, Cl. 521-51.000.

DoMinh, Thap, to Eastman Kodak Company. Heat erasable photographic element and process comprising silver halide. 4,433,037, Cl. 430-19.000.

Donaggio, Paolo: *See*—
Amesso, Claudio; and Donaggio, Paolo, 4,432,177, Cl. 52-309.170.

Dorigo, Oddino, to Societa' Industriale Bagnolo S.I.B. S.r.l. Mesh-belt conveyor for industrial furnaces. 4,432,450, Cl. 198-832.000.

Doryokuro Kakunenryo Kaihatsu, Jigyodan: *See*—
Onuki, Osamu; and Kirisawa, Toyohiko, 4,432,208, Cl. 62-55.500.

Douglas, Jack. Cradle case. 4,432,521, Cl. 248-176.000.

Dow Chemical Co., The: *See*—
Caines, Ronald S., 4,432,408, Cl. 165-1.000.
Evani, Syamalarao, 4,432,881, Cl. 252-8.50A.
Gilpin, Jo Ann, 4,433,155, Cl. 549-205.000.
Harper, Stephen M.; and Stultz, Jeffrey H., 4,432,913, Cl. 261-97.000.
Keith, Earl K., 4,432,936, Cl. 420-590.000.
McLeod, David M., 4,432,651, Cl. 366-336.000.
Page, Judith L.; Haigh, Daniel H.; and Peters, James, 4,432,968, Cl. 424-81.000.
Pawloski, Chester E., 4,433,148, Cl. 544-322.000.

Dow Corning Corporation: *See*—
Bokerman, Gary N.; and Langley, Neal R., 4,433,096, Cl. 524-783.000.

Harper, Jack R., 4,433,069, Cl. 521-99.000.
Dow, Robert L.: *See*—
Kennedy, Katherine L.; Proctor, Paul W.; and Dow, Robert L., 4,432,816, Cl. 149-19.300.
Dowty Mining Equipment Limited: *See*—
Buckmaster, Adrian C., 4,432,673, Cl. 405-302.000.
Doyle, Terrence W.: *See*—
Kaneko, Takushi; Easery, John M.; Schmitz, Henry; and Doyle, Terrence W., 4,433,158, Cl. 549-332.000.
Draftex Development AG: *See*—
Weimar, Erich, 4,432,166, Cl. 49-491.000.
Dreher, Dieter: *See*—
Bauer, Kurt H.; Osterwald, Hermann; Lehmann, Klaus; and Dreher, Dieter, 4,433,076, Cl. 523-342.000.
Dresser Industries, Inc.: *See*—
Moriarty, Keith A.; and Milligan, Lowell R., 4,432,143, Cl. 33-178.00F.
Nezuka, Kenjiro, 4,432,585, Cl. 303-10.000.
Drozdov, Sergei S. Reversible periodic magnetic focusing system. 4,433,270, Cl. 315-5.350.
Drucktenhengst, Rolf, to Carl Freudenberg, Firma. Cassette seal. 4,432,557, Cl. 277-153.000.
Dueker, James E.; Foster, Ronald C.; and Whiteson, Bennett V., to United States of America, Air Force. Radiation protection louver. 4,432,609, Cl. 350-266.000.
Duffner, Erich, to Gebruder Junghans GmbH. Projectile fuse responsive to the spinning motion of a projectile. 4,432,283, Cl. 102-244.000.
Duhame, Dean C. Home security and garage door operator system. 4,433,274, Cl. 318-283.000.
Dulux Australia Ltd.: *See*—
Braun, Willy, 4,432,837, Cl. 203-37.000.
Dumaitre, Bernard; Perrin, Claude; Corna, Pierre-Jean; and Streichenberger, Gilles, to Bouchara, Emile. Anti-hypertensive benzodioxan derivatives. 4,432,984, Cl. 424-267.000.
Dunkleman, John J.: *See*—
Euker, Charles A., Jr.; Wesselhoft, Robert D.; Dunkleman, John J.; Aquino, Dolores C.; and Gouker, Toby R., 4,432,773, Cl. 48-197.00R.
Dunlop Sports Company, div. Dunlop Tire and Rubber Corp.: *See*—
Byars, Larry W., 4,432,550, Cl. 273-169.000.
Dunn, Charles S., to Owens-Corning Fiberglas Corporation. Method and apparatus for determining the level of slag containing iron or iron compounds in a glass melting furnace. 4,433,420, Cl. 373-39.000.
Dunn, Emmett L. Valve testing apparatus. 4,432,227, Cl. 73-49.800.
Du Pont de Nemours, E. I., and Company: *See*—
Grot, Walther G., 4,433,082, Cl. 524-755.000.
Haber, Stephen B., 4,432,974, Cl. 424-184.000.
McLain, Stephan J.; and Waller, Francis J., 4,432,904, Cl. 260-330.600.
Raynolds, Stuart; and Fournier, Louis B., 4,432,882, Cl. 252-8.55R.
Duponteil, Daniel: *See*—
Bic, Jean-Claude; Brossard, Pierre C.; and Duponteil, Daniel, 4,433,310, Cl. 332-9.00R.
Dupre, Armand, to Societe Dupre. Safety hook or elastic fastening and securing cables of the sandow type. 4,432,121, Cl. 24-343.000.
Duracell Inc.: *See*—
Wiacek, Marian, 4,433,035, Cl. 429-27.000.
Duraline Products Corporation: *See*—
Baldyga, Joseph W., 4,432,664, Cl. 405-3.000.
Duriron Company, Inc., The: *See*—
Helferich, Richard L.; and Shook, William B., 4,432,798, Cl. 106-38.300.
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, to American Cyanamid Company. Therapeutically active 3-amino-1-phenyl-(and substituted phenyl)-2-pyrazolines. 4,432,991, Cl. 424-273.00P.
Dutcher, Daniel P., to Champion International Corporation. Round ice cream carton. 4,432,488, Cl. 229-21.000.
Duvall, Clarence E. Adjustable chair support. 4,432,525, Cl. 248-430.000.
Dyar, Harrison G. Thermal insulating system particularly adapted for building construction. 4,432,180, Cl. 52-407.000.
Dyer, Robert E.; Swanson, Scott C.; and Hicks, Robert A., to Sangamo Weston, Inc. System for processing data received from a portable data store and for clearing the store. 4,433,387, Cl. 364-900.000.
Dykes, Norman L.: *See*—
Taylor, Albert J.; and Dykes, Norman L., 4,432,821, Cl. 156-89.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Puhringer, Josef A., 4,433,013, Cl. 427-337.000.
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, to Siemens Aktiengesellschaft. Machine for SZ-twisting by means of a twisting disc and a tubular accumulator. 4,432,199, Cl. 57-294.000.
E. C. H. Will (GmbH & Co.): *See*—
Besemann, Alfred; and Rehwald, Willi, 4,432,262, Cl. 83-311.000.
E. R. Squibb & Sons, Inc.: *See*—
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,432,971, Cl. 424-177.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,432,972, Cl. 424-177.000.
East, Don G.: *See*—
Taber, Louis; and East, Don G., 4,433,424, Cl. 375-106.000.
Eastman Kodak Company: *See*—
DoMinh, Thap, 4,433,037, Cl. 430-19.000.
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,433,130, Cl. 528-173.000.
Harvey, Douglass C., 4,432,625, Cl. 354-275.000.
Silverman, Robert A.; and Hoyen, Harry A., 4,433,047, Cl. 430-609.000.
Solberg, John C.; Piggin, Roger H.; and Wilgus, Herbert S., 4,433,048, Cl. 430-434.000.
Eaton Corporation: *See*—
Caputi, William J., Jr., 4,433,334, Cl. 343-450.000.
Russell, John D., 4,432,431, Cl. 180-248.000.
Ebauches, Electroniques, S.A.: *See*—
Leuthold, Oskar, 4,433,371, Cl. 363-127.000.
Ebeling, Harold O.: *See*—
Honerkamp, Joseph D.; and Ebeling, Harold O., 4,432,779, Cl. 55-233.000.
Ebinger, Horst; Kadner, Martin; and Luthardt, Guenther, to Nukem GmbH. Process for the safe intermediate and final storage of tritium. 4,432,892, Cl. 252-628.000.
Eble, Monika; and Lang, Gusztav, to Hilti Aktiengesellschaft. Device for discharging a plural-component material. 4,432,469, Cl. 222-134.000.
EBSCO Industries, Inc.: *See*—
Gowing, James R., 4,432,156, Cl. 43-42.310.
Gowing, James R., 4,432,157, Cl. 43-42.310.
Eckler, Thomas A.: *See*—
Manty, Brian A.; Eckler, Thomas A.; and Fujishiro, Shiro, 4,433,005, Cl. 427-38.000.
Edwards, David J.: *See*—
Boyars, Carl; and Edwards, David J., 4,432,285, Cl. 109-49.500.
Eian, Gilbert L., to Minnesota Mining and Manufacturing Company. Reduced-stress vapor-sorptive garments. 4,433,024, Cl. 428-198.000.
Eichler, Volker; and Trinks, Hilmar, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Control system for sheet-fed multi-color rotary printing machines. 4,432,280, Cl. 101-230.000.
Eichrodt, Dieter; and Elsen, Friedhelm, to Siemens Aktiengesellschaft. Integrated logic MOS counter circuit. 4,433,372, Cl. 377-116.000.
Eide, Olav A.: *See*—
Andreassen, Knut A.; Eide, Olav A.; and Beyer, Gerhard, 4,432,859, Cl. 204-296.000.
Eilerman, Robert G.: *See*—
Willis, Brian J.; and Eilerman, Robert G., 4,432,378, Cl. 131-277.000.
Eisai Co., Ltd.: *See*—
Hamamura, Kimio; Akasaka, Kozo; and Yamagishi, Youji, 4,433,159, Cl. 549-411.000.
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.
Eisenmann, Siegfried. Hydrostatic gear ring machine. 4,432,712, Cl. 418-171.000.
Ejiri, Yoshihiro: *See*—
Niiro, Yasuhiko; and Ejiri, Yoshihiro, 4,432,605, Cl. 350-96.230.
Eldridge, Charles W., to Paxall, Inc. Trailing edge folder. 4,432,745, Cl. 493-10.000.
Eleazar, Antonio E.; Heck, Ronald M.; Dettling, Joseph C.; and Lui, Yiu-Kwan, to Engelhard Corporation. Skeletal isomerization of n-alkenes. 4,433,191, Cl. 585-671.000.
Electric Power Research Institute, Inc.: *See*—
Hooper, George D., 4,432,411, Cl. 165-47.000.
Lockett, John L., 4,432,931, Cl. 376-248.000.
Ellerstorfer, Herbert. Birdbath house. 4,432,303, Cl. 119-17.000.
Elliott, Henry H., to General Electric Company. Ion exchange recovery of uranium. 4,432,944, Cl. 423-7.000.
Elscint, Inc.: *See*—
Barnea, Daniel I., 4,433,427, Cl. 378-146.000.
Elsen, Friedhelm: *See*—
Eichrodt, Dieter; and Elsen, Friedhelm, 4,433,372, Cl. 377-116.000.
Elsner, Bertram F.; and Molison, Robert E., to Elsner Engineering Works, Inc. Roll-wrapping apparatus and method. 4,432,187, Cl. 53-137.000.
Elsner Engineering Works, Inc.: *See*—
Elsner, Bertram F.; and Molison, Robert E., 4,432,187, Cl. 53-137.000.
Emerson Electric Co.: *See*—
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,433,233, Cl. 219-553.000.
Kunz, Bernard L., 4,432,492, Cl. 236-92.00B.
Emery Industries, Inc.: *See*—
Zilch, Karl T., 4,433,002, Cl. 426-640.000.
Emery, Jared M.; and Lam, Dominic M., to Baylor College of Medicine. Monoclonal antibodies against lens epithelial cells and preventing proliferation of remnant lens epithelial cells after extracapsular extraction. 4,432,751, Cl. 604-49.000.
Emhart Industries, Inc.: *See*—
Dahms, Francis A., 4,432,783, Cl. 65-239.000.
Marcinek, John A., 4,432,530, Cl. 249-142.000.
Emmerich, Claude L.: *See*—
Siff, Elliott J.; and Emmerich, Claude L., 4,432,468, Cl. 222-55.000.
Emshoff, Horst W.; and Kusebauch, Walter, to Siemens Aktiengesellschaft. Cooling arrangement and method of operating the same. 4,432,878, Cl. 210-662.000.
Endo, Kiyoshi: *See*—
Sugiyama, Iwakichi; Endo, Kiyoshi; and Takaoka, Yukihisa, 4,433,127, Cl. 528-17.000.
Endress u. Hauser GmbH u. Co.: *See*—
Luder, Ernst; and Kallfass, Traugott, 4,433,319, Cl. 338-34.000.
Energy Innovations, Inc.: *See*—
Gourdine, Meredith C., 4,433,003, Cl. 427-27.000.

Engel, Dusan J.: *See*—
Symon, Ted; and Engel, Dusan J., 4,433,194, Cl. 585-803.000.
Engelhard Corporation: *See*—
Eleazar, Antonio E.; Heck, Ronald M.; Dettling, Joseph C.; and Lui, Yiu-Kwan, 4,433,191, Cl. 585-671.000.
Engenhart, Reinhold: *See*—
Arendt, Gerhard; Benz, Roland; Engenhart, Reinhold; and Schmidt, Viktor, 4,432,501, Cl. 242-47.000.
Engle, Gary L., to General Electric Company. Automatic noise rejection for use in scanner and the like. 4,433,304, Cl. 330-281.000.
Engler, Rolf: *See*—
Schmidt, Dieter; and Engler, Rolf, 4,432,237, Cl. 73-632.000.
Enmoto, Kazuhiro: *See*—
Hinoda, Yuji; and Enmoto, Kazuhiro, 4,432,844, Cl. 204-54.00R.
Envirosol Systems International, Ltd.: *See*—
Vasishth, Ramesh C.; and Wang, Robert S., 4,432,797, Cl. 106-34.000.
Eppley, William J.: *See*—
Horning, Robert J.; and Eppley, William J., 4,433,036, Cl. 429-114.000.
Equitz, Russell E., Jr.; and Strong, Bruce K. Phonograph record holding device. 4,432,577, Cl. 294-16.000.
Erad Inc.: *See*—
Sullivan, Peter J., 4,432,308, Cl. 123-1.00A.
Erdmann, Francis M.: *See*—
Jones, Addison B.; and Erdmann, Francis M., 4,432,134, Cl. 29-578.000.
Erickson, Edward H., to Riker Laboratories, Inc. Tetrazoles bonded to certain polycyclic aromatic systems and anti-allergic use thereof. 4,432,986, Cl. 424-269.000.
Essery, John M.: *See*—
Kaneko, Takushi; Essery, John M.; Schmitz, Henry; and Doyle, Terrence W., 4,433,158, Cl. 549-332.000.
Este, Grantley O., to Northern Telecom Limited. Surface relief measuring equipment. 4,433,386, Cl. 364-563.000.
Estel-Hoesch Werke Aktiengesellschaft: *See*—
Hoffmann, Ernst H.; and Arendt, Hans F., 4,432,111, Cl. 8-158.000.
Estep, Timothy N., to Baxter Travenol Laboratories, Inc. Additive sterol solution and method for preserving normal red cell morphology in whole blood during storage. 4,432,750, Cl. 604-4.000.
Ethicon, Inc.: *See*—
Shalaby, Shalaby W.; Schipper, Edgar S.; and Koelmel, Donald F., 4,433,161, Cl. 560-66.000.
Euker, Charles A., Jr.; Wesselhoft, Robert D.; Dunkleman, John J.; Aquino, Dolores C.; and Gouker, Toby R. Fluidized bed catalytic coal gasification process. 4,432,773, Cl. 48-197.00R.
Eustis, Augustus W.: *See*—
Eustis, Mary S.; and Eustis, Augustus W., 4,433,377, Cl. 364-200.000.
Eustis, Mary S.; and Eustis, Augustus W. Data processing with format varying. 4,433,377, Cl. 364-200.000.
Evani, Syamalarao, to Dow Chemical Company, The. Water-dispersible hydrophobic thickening agent. 4,432,881, Cl. 252-8.50A.
Evans, Alyce D.; and Hilty, John R., to Testco, Inc. Combustion air bubble chamber method. 4,432,721, Cl. 431-4.000.
Exner, Reinhard: *See*—
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, 4,432,772, Cl. 48-66.000.
Exxon Production Research Co.: *See*—
Gregory, Edward W.; and Baer, Gregory G., 4,432,420, Cl. 166-355.000.
Exxon Research and Engineering Co.: *See*—
Swart, Gerrit S.; Dauber, Louis S.; and O'Connor, Richard P., 4,432,862, Cl. 208-64.000.
West, Theodore H.; and Thompson, John A., 4,432,866, Cl. 208-321.000.
Facom: *See*—
Caroff, Yves, 4,432,145, Cl. 33-288.000.
Fairchild Camera and Instrument Corporation: *See*—
Carey, Maurice E., 4,433,414, Cl. 371-27.000.
Falco, Lucien, to Cabloptic S.A. Method and apparatus for coupling at least two optical fibers by means of a holographic lens. 4,432,600, Cl. 350-96.180.
Falleroni, Charlene A.: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., 4,433,016, Cl. 428-34.000.
Fantone, Stephen D., to Polaroid Corporation. Method of forming contoured optical layers on glass elements. 4,432,832, Cl. 156-630.000.
Fantone, Stephen D., to Polaroid Corporation. Method and apparatus for verifying security labels. 4,433,437, Cl. 382-31.000.
Farris, Charles L.: *See*—
Gettleman, Lawrence; Farris, Charles L.; Rawls, H. Ralph; and LeBouef, Ralph J., Jr., 4,432,730, Cl. 433-168.000.
Farris, John R.; and Tucci, Allan T., to McDonnell Douglas Corporation. Resin impregnation ring. 4,432,302, Cl. 118-410.000.
Fasang, Patrick P., to Siemens Corporation. Built-in apparatus and method for testing a microprocessor system. 4,433,413, Cl. 371-25.000.
Fattaleh, John B. Personal health care device. 4,432,729, Cl. 433-118.000.
Faul, Wolfgang; and Kastening, Bertel, to Kernforschungsanlage Julich GmbH. Apparatus for oxidation or reduction process in water solution with electrochemically active catalyst on a porous carrier. 4,432,872, Cl. 210-205.000.
Featsent, Wendell P., to General Motors Corporation. Method of terminating a light conductive ribbon. 4,432,129, Cl. 29-447.000.
Federal Screw Works: *See*—
Ostrowski, Carl L.; and White, Bertram, 4,433,210, Cl. 381-53.000.
Fehler, Henry P. Jointer for compacting and smoothing mortar joints of masonry walls. 4,432,115, Cl. 15-105.500.
Fehlner, Francis P.; and Wein, William J., to Corning Glass Works. Method and apparatus for producing mica film. 4,432,852, Cl. 204-181.00F.
Fehr, Charles; and Chloff, Gunther, to Firmenich SA. Process for the preparation of (+)-p-mentha-2,8-dien-1-ol. 4,433,183, Cl. 568-829.000.
Feikema, Roger H.; and Bakker, Harry J. Tricycle recumbent. 4,432,561, Cl. 280-281.0LP.
Feldkamper, Richard, to Windmoller & Holscher. Apparatus for placing packets of tube sections in the stacking magazine of a rotary applicator. 4,432,686, Cl. 414-77.000.
Fellas, Christakis N., to British Aerospace Public Limited Company. Solar power arrays for spacecraft. 4,433,201, Cl. 136-251.000.
Feller, Terry L. Adjustable neck-body joint for guitar-like instrument. 4,432,267, Cl. 84-293.000.
Felten & Guilleaume Carlswerk Aktiengesellschaft: *See*—
Schmitz, H.-Joachim; Braun, Dieter; Trodler, Dieter; and Cramer, Hugo, 4,432,196, Cl. 57-204.000.
Fenn, John W.: *See*—
Boutros, Kamal S.; and Fenn, John W., 4,432,592, Cl. 339-103.00M.
Fenton, Donald M.: *See*—
Gowdy, Hugh W.; and Fenton, Donald M., 4,432,962, Cl. 423-573.00R.
Ferag AG: *See*—
Stauber, Hans-Ulrich, 4,432,685, Cl. 414-31.000.
Ferris, Michael J., to Beecham Group Limited. Method of treating obesity hyperglycemia, inflammation and platelet aggregation. 4,432,993, Cl. 424-285.000.
Fesman, Gerald, to Stauffer Chemical Company. Flame and dripping ember retardant flexible polyurethane foams. 4,433,071, Cl. 521-107.000.
Fetter, Jozsef: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.
Fiat Auto S.p.A.: *See*—
Tronville, Pier G., 4,432,564, Cl. 280-689.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Poly sulfoxides from 1,3,4-thiadiazole-2,5-dithiol. 4,432,847, Cl. 204-158.00R.
Findeisen, Kurt, to Bayer Aktiengesellschaft. Preparation of pivaloyl cyanide. 4,432,910, Cl. 260-545.00R.
Finegold, Aaron N. Urethral anesthetic devices. 4,432,758, Cl. 604-104.000.
Fineo, Carlo: *See*—
Withers, L. Andrew, Jr.; Withers, William D.; and Fineo, Carlo, 4,432,526, Cl. 248-542.000.
Finkenzeller, Johann; and Reinhardt, Juergen, to Siemens Aktiengesellschaft. Diagnostic X-ray installation for radiography and fluoroscopy. 4,433,429, Cl. 378-99.000.
Firing Circuits, Inc.: *See*—
Windebank, Robert W., 4,433,294, Cl. 324-426.000.
Firmenich SA: *See*—
Fehr, Charles; and Chloff, Gunther, 4,433,183, Cl. 568-829.000.
Fischer, Helmut; Schafer, Jurgen; and Thomas, Gunter, to Original Hanau Heraeus GmbH. Cooled discharge lamp having a fluid cooled diaphragm structure. 4,433,265, Cl. 313-22.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet feeding system for printing machines. 4,432,539, Cl. 271-3.100.
Fischer, Joel E.: *See*—
Milionis, Jerry P.; and Fischer, Joel E., 4,432,787, Cl. 71-94.000.
Fischer, Victor H., to Thermal Systems Limited. Rotary external combustion engine. 4,432,203, Cl. 60-511.000.
Fisher, Ernest P.: *See*—
Welch, William R.; Fisher, Ernest P.; and Yonker, John H., 4,432,416, Cl. 166-117.500.
Fisons plc: *See*—
Robinson, David, 4,432,990, Cl. 424-273.00R.
Fixel, Irving E. Compresion hip screw apparatus. 4,432,358, Cl. 128-92.0BB.
Flagstad, Carl O.: *See*—
Hansen, Christian B.; and Flagstad, Carl O., 4,432,710, Cl. 418-61.00B.
Flanagan, Joseph E.: *See*—
Witucki, Edward F.; and Flanagan, Joseph E., 4,432,814, Cl. 149-19.100.
Fleming, James S., Jr.; and Buyniski, Joseph P., to Bristol-Myers Company. Pharmaceutical compositions. 4,432,980, Cl. 424-251.000.
Flockenhaus, Claus: *See*—
Hackler, Erich; Flockenhaus, Claus; and Lommerzheim, Werner, 4,433,066, Cl. 518-706.000.
FMC Corporation: *See*—
Orlando, Franklin P., 4,432,190, Cl. 56-1.000.
Plummer, Ernest L., 4,433,182, Cl. 568-808.000.
Focus Environmental Systems: *See*—
Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., 4,432,344, Cl. 126-438.000.

Fohlen, George M.: *See*—
Varma, Indra K.; Fohlen, George M.; and Parker, John A., 4,433,115, Cl. 525-417.000.

Follows, James S., to Vanguard Plastics Ltd. Cabinet shelf support bracket. 4,432,523, Cl. 248-250.000.

Folser, Karl: *See*—
Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, 4,432,284, Cl. 104-7.00R.

Foote, Daniel J. Portal guard. 4,432,162, Cl. 49-55.000.

Forgach, Lilla: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Formosa Plastics Corporation: *See*—
Liau, Shung-Chung; Cheng, Wei-Min; and Young, Uen-Long, 4,432,840, Cl. 204-14.00N.

Forry, John S.; and Garrick, John R., to Armstrong World Industries, Inc. Apparatus for forming building materials comprising non-woven webs. 4,432,714, Cl. 425-83.100.

Forster, Karl-Heinz, to VEB Kombinat Polygraph "Werner Lamberz". Control system for printing machines. 4,433,426, Cl. 377-2.000.

Foster, Ronald C.: *See*—
Dueker, James E.; Foster, Ronald C.; and Whiteson, Bennett V., 4,432,609, Cl. 350-266.000.

Fournier, Louis B.: *See*—
Raynolds, Stuart; and Fournier, Louis B., 4,432,882, Cl. 252-8.55R.

Fraioli, Joseph. Gas-fired infrared projection heater. 4,432,727, Cl. 432-227.000.

Francis, Samuel: *See*—
Sherman, Benjamin F., Jr.; and Francis, Samuel, 4,432,120, Cl. 24-299.000.

Frankel, Milton B.; and Witucki, Edward F., to United States of America, Air Force. Azido fluorodinitro amines. 4,432,815, Cl. 149-19.300.

Frankel, Milton B.; and Witucki, Edward F., to United States of America, Air Force. Propellant containing an azidonitrocarbamate plasticizer. 4,432,817, Cl. 149-19.500.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, 4,432,284, Cl. 104-7.00R.

Fraser, Bruce A.; and Holt, Curtis, Jr., to Carrier Corporation. Refrigeration compressor capacity control means and method. 4,432,705, Cl. 417-295.000.

Frebault, Jean Claude, to Thomson-CSF. Arrangement of a polychrome cathode-ray tube for operation with a reserved electron gun. 4,433,292, Cl. 324-404.000.

Fredzell, Georg, to Siemens Aktiengesellschaft. Apparatus for the areal recording of x-ray images. 4,433,430, Cl. 378-108.000.

Freitag, Dieter: *See*—
Idel, Karsten; Freitag, Dieter; Bottenbruch, Ludwig; and Neuner, Otto, 4,433,138, Cl. 528-388.000.

French State, The: *See*—
Melchior, Jean F.; and Andre, Thierry M., 4,432,206, Cl. 60-606.000.

Frenzel, Bernd. Chemiluminescent immunoassays with triphenylmethane dyes activated by H_2O_2 and a chloramine. 4,433,060, Cl. 436-518.000.

Frey, Robert: *See*—
Bachmann, Hans; and Frey, Robert, 4,432,399, Cl. 139-370.200.

Frey, Rudolf; and Litschke, Peer-Ingo, to VFI, Verwertungsgesellschaft fur Industrieruckstande mbH. Process for the storage and dumping of waste materials. 4,432,666, Cl. 405-129.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Arens, Egidius; and Patel, Ravin, 4,433,397, Cl. 367-122.000.

Friedmann & Maier Aktiengesellschaft: *See*—
Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, 4,432,320, Cl. 123-357.000.

Fritzsche, Dodge & Olcott, Inc.: *See*—
Willis, Brian J.; and Eilerman, Robert G., 4,432,378, Cl. 131-277.000.

Frungel, Frank. Forward-scatter visibility meter. 4,432,645, Cl. 356-338.000.

Fuchizawa, Tetsuro: *See*—
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,433,030, Cl. 428-476.900.

Fuji Electric Company, Ltd.: *See*—
Ohmori, Tsuguharu; and Ueno, Sadaumi, 4,432,535, Cl. 266-239.000.
Tanaka, Akio, 4,432,447, Cl. 194-100.00A.
Watanabe, Atsuo; Kaneko, Teruo; Tanaka, Takeo; and Saito, Yoshio, 4,432,939, Cl. 422-93.000.

Fuji Photo Film Co., Ltd.: *See*—
Ishige, Sadao; Sato, Kozo; and Iwakura, Ken, 4,433,156, Cl. 549-227.000.
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,432,854, Cl. 204-206.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,433,030, Cl. 428-476.900.

Fuji Photo Optical Co., Ltd.: *See*—
Oshiro, Susumu, 4,432,349, Cl. 128-4.000.

Fujii, Yozo: *See*—
Nosaka, Isao; Sakaguchi, Hirofumi; Shiozawa, Takao; and Fujii, Yozo, 4,432,633, Cl. 355-8.000.

Fujinami, Shosaku: *See*—
Ishii, Yoshiaki; Ando, Naoyoshi; Kume, Tsutomu; and Fujinami, Shosaku, 4,432,290, Cl. 110-346.000.

Fujirebio Kabushiki Kaisha: *See*—
Sugiyama, Masami; Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,432,896, Cl. 260-112.50R.

Fujisash Company: *See*—
Hinoda, Yuji; and Enmoto, Kazuhiro, 4,432,844, Cl. 204-54.00R.

Fujishiro, Shiro: *See*—
Manty, Brian A.; Eckler, Thomas A.; and Fujishiro, Shiro, 4,433,005, Cl. 427-38.000.

Fujita, Yoshiji: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.

Fujitsu Fanuc Ltd.: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,433,275, Cl. 318-578.000.

Fujitsu Limited: *See*—
Furuya, Toshikazu, 4,432,133, Cl. 29-571.000.
Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, 4,433,306, Cl. 330-297.000.
Oritani, Atsushi, 4,433,393, Cl. 365-203.000.

Fujiwara, Shinji: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.

Fukudome, Hiroshi: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.

Fukui, Yoshiharu: *See*—
Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, 4,433,110, Cl. 525-323.000.

Fukushima, Yoshio: *See*—
Kawashima, Ikue; Fukushima, Yoshio; Murano, Tamio; and Suzuki, Toshitatsu, 4,432,622, Cl. 354-408.000.

Fukuyo, Hiroshi: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,432,788, Cl. 75-3.000.

Funabashi, Kiyomi: *See*—
Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, 4,432,894, Cl. 252-632.000.

Funaki, Motokatsu. Wall construction for architectural structure. 4,432,181, Cl. 52-459.000.

Funaki, Shinsuke: *See*—
Akanabe, Yuichi; Ikeda, Hiroaki; Maeda, Masatoshi; and Funaki, Shinsuke, 4,432,598, Cl. 350-6.700.

Funamoto, Akihiko: *See*—
Kobayashi, Noriyuki; and Funamoto, Akihiko, 4,433,079, Cl. 523-404.000.

Funato, Masatomi: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,433,039, Cl. 430-58.000.

Furjanic, Ivan, to Siemens Aktiengesellschaft. Apparatus for displaying characters on a picture screen of a display unit. 4,433,330, Cl. 340-750.000.

Furstenwerth, Hauke, to Bayer Aktiengesellschaft. Cationic thiadiazolyl triazene dyestuffs. 4,432,897, Cl. 260-140.000.

Furukawa Electric Co., Ltd., The: *See*—
Shirasaka, Yusei; Fuse, Kenichi; and Umezu, Haruo, 4,432,807, Cl. 134-2.000.

Furuno, Hiroshi: *See*—
Munekata, Katsusuke; Furuno, Hiroshi; and Someno, Noboru, 4,432,652, Cl. 368-69.000.

Furusawa, Sadayoshi: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.

Furuta, Tadaaki: *See*—
Yamawaki, Maokuni; Suzuki, Shozo; and Furuta, Tadaaki, 4,432,871, Cl. 210-195.100.

Furuta, Yukio: *See*—
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.

Furuya, Toshikazu, to Fujitsu Limited. Method of producing a field effect transistor. 4,432,133, Cl. 29-571.000.

Fuse, Kenichi: *See*—
Shirasaka, Yusei; Fuse, Kenichi; and Umezu, Haruo, 4,432,807, Cl. 134-2.000.

Futaki, Hisao: *See*—
Oishi, Tetsu; Oda, Makoto; and Futaki, Hisao, 4,432,211, Cl. 62-155.000.

Future Tech, Inc.: *See*—
Howe, Gary L.; and Koutavas, Samuel G., 4,432,341, Cl. 126-417.000.

G & L Manufacturing & Develop. Corp.: *See*—
Lamm, George L., 4,432,472, Cl. 222-174.000.

G. Siempelkamp GmbH & Co.: *See*—
Siempelkamp, Dieter; and Gotz, Wolfgang, 4,432,828, Cl. 156-285.000.

Gabriele, Leonard A., to Lear Siegler, Inc. Six station broaching machine. 4,432,130, Cl. 29-563.000.

Gagliani, John: *See*—
Long, John V.; and Gagliani, John, 4,433,068, Cl. 521-54.000.

Gale, Robert M.: *See*—
Shell, John W.; and Gale, Robert M., 4,432,964, Cl. 424-14.000.

Gallivan, Timothy J., to General Electric Company. Method for producing nuclear fuel pellets, and product thereof. 4,432,915, Cl. 264-0.500.
Gane, Timothy L.: *See—*
Jones, William R.; Trivedi, Harish S.; and Gane, Timothy L., 4,433,141, Cl. 544-25.000.
Garapon, Jacques: *See—*
Weill, Jerome; Garapon, Jacques; and Sillion, Bernard, 4,433,157, Cl. 549-255.000.
Garlinghouse, Roland E. Closed pressure actuated system for placement bucket. 4,432,578, Cl. 294-69.00R.
Garner, Mark D.: *See—*
Clark, William D.; Garner, Mark D.; Rhodes, John H., Jr.; and Wilzbach, Bernard L., 4,432,541, Cl. 271-251.000.
Garnett, John L.; Long, Mervyn A.; and Levot, Ronald G., to Unisearch Limited. Heterogeneous catalyst. 4,432,889, Cl. 502-5.000.
Garrick, John R.: *See—*
Forry, John S.; and Garrick, John R., 4,432,714, Cl. 425-83.100.
Garvey, Louis P.; and Maye, Robert A., to General Motors Corporation. Lock striker anchor plate assembly. 4,432,575, Cl. 292-341.180.
Gaske, Joseph E.; and Pennanen, Hannu K., to DeSoto, Inc. Pigmented, corrosion resistant, thermosetting coating compositions. 4,433,014, Cl. 427-380.000.
Gaudiana, Russell A.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,433,132, Cl. 528-191.000.
Gay, Charles F.: *See—*
Jester, Theresa L.; Yerkes, John W.; Gay, Charles F.; and Bottenberg, William R., 4,433,200, Cl. 136-251.000.
Gebhard Balluff Fabrik Feinmechanischer: *See—*
Hermle, Rolf; Kammerer, Heinz; and Langheinrich, Hans, 4,433,309, Cl. 331-65.000.
Gebruder Junghans GmbH: *See—*
Duffner, Erich, 4,432,283, Cl. 102-244.000.
Gee, Howard J.: *See—*
Tighe, Brian J.; and Gee, Howard J., 4,433,111, Cl. 525-326.200.
Gefroerer, Stanislaus; and Vollmeyer, Werner, to Siemens Aktiengesellschaft. Telephone switching network for digital speech transmission. 4,433,411, Cl. 370-80.000.
Geiger, William J.: *See—*
Moriarity, Thomas C.; and Geiger, William J., 4,432,850, Cl. 204-181.00C.
Geisinger, Wolfgang. Pallet wrapper. 4,432,185, Cl. 53-138.00R.
Gemi, Roberto: *See—*
De Marco, Giuliano; and Gemi, Roberto, 4,433,352, Cl. 360-105.000.
General Electric Company: *See—*
Balchunas, Charles A., 4,433,231, Cl. 219-253.000.
Bolon, Donald A.; and Gorczyca, Thomas B., 4,433,131, Cl. 528-185.000.
Davis, Lewis B., Jr.; and Steber, Charles E., 4,432,207, Cl. 60-723.000.
Elliott, Henry H., 4,432,944, Cl. 423-7.000.
Engle, Gary L., 4,433,304, Cl. 330-281.000.
Gallivan, Timothy J., 4,432,915, Cl. 264-0.500.
Giles, Harold F., Jr., 4,433,104, Cl. 525-180.000.
Greenlee, Paul W., 4,432,135, Cl. 29-598.000.
Greenlee, Paul W., 4,433,262, Cl. 310-214.000.
Grup, Howard W., 4,432,608, Cl. 350-128.000.
Haaf, William R.; Huebner, James A.; and Katchman, Arthur, 4,433,088, Cl. 524-153.000.
Howell, Edward K., 4,433,326, Cl. 340-310.00A.
Roberts, Gerald E.; and Staples, Alfred G., 4,433,316, Cl. 333-189.000.
Schneider, Harold N.; Simpson, James H.; and Weidman, Raymond F., 4,433,221, Cl. 200-144.0AP.
Vandegraaf, Johannes J., 4,433,315, Cl. 333-174.000.
Wilkinson, Stanley B., 4,433,353, Cl. 361-80.000.
General Instrument Corporation: *See—*
Cowles, Dean S., 4,433,225, Cl. 200-340.000.
General Motors Corporation: *See—*
Borman, August H.; and Perlick, Mark A., 4,432,255, Cl. 74-869.000.
Brittin, Craig E., 4,433,227, Cl. 219-10.410.
Featsent, Wendell P., 4,432,129, Cl. 29-447.000.
Garvey, Louis P.; and Maye, Robert A., 4,432,575, Cl. 292-341.180.
Karadsheh, Sam M.; and Radomski, Thomas A., 4,433,370, Cl. 363-124.000.
Klomp, Edward D.; and Stevens, David A., 4,432,312, Cl. 123-188.0VA.
Lindgren, Timothy F., 4,433,280, Cl. 322-89.000.
Longhouse, Richard E.; Cornwell, William D., Jr.; and Buchanan, Harry C., Jr., 4,433,263, Cl. 310-233.000.
Widdowson, Richard E., 4,433,321, Cl. 338-42.000.
Wize, Gary A., 4,432,524, Cl. 248-395.000.
General Supply (Construction) Co., Ltd.: *See—*
Pelekis, Emmanouil A., 4,432,314, Cl. 123-238.000.
Gentex Corporation: *See—*
Grick, Shelly J.; and Beautz, Joseph A., 4,432,099, Cl. 2-412.000.
Georg Fischer Aktiengesellschaft: *See—*
Thalmann, Alfred, 4,432,572, Cl. 285-412.000.
George, Raymond A.: *See—*
Gjertsen, Robert K.; Wilson, John F.; and George, Raymond A., 4,432,934, Cl. 376-333.000.
Georgetown University: *See—*
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., 4,433,286, Cl. 324-61.00R.
Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,432,261, Cl. 83-37.000.
Gersbach, John E., to International Business Machines Corporation. Band gap regulator circuit. 4,433,283, Cl. 323-314.000.
Gesellschaft fur Biotechnologische Forschung: *See—*
Haars, Annegret; and Huttermann, Aloys, 4,432,921, Cl. 264-109.000.
Geshner, Robert A.: *See—*
Caprari, Fausto; and Geshner, Robert A., 4,432,641, Cl. 356-237.000.
Gettleman, Lawrence; Farris, Charles L.; Rawls, H. Ralph; and LeBouef, Ralph J., Jr., to Gulf South Research Institute. Soft and firm denture liner for a composite denture and method for fabricating. 4,432,730, Cl. 433-168.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Stuckmann, Dieter; and Heitkamp, Herbert, 4,432,665, Cl. 405-143.000.
Ghim, Duk K. Molten material dispensing apparatus. 4,432,715, Cl. 425-87.000.
Gibby, William H., Jr., to Occidental Chemical Corporation. Blends of vinyl halide-polyolefin graft copolymers and ABS polymers. 4,433,101, Cl. 525-70.000.
Gilad, Gad; Gilad, Varda; and Wilchek, Meir, to Yeda Research and Development Co., Ltd. Derivatives of α-difluoromethylornithine useful in analysis. 4,433,051, Cl. 435-7.000.
Gilad, Varda: *See—*
Gilad, Gad; Gilad, Varda; and Wilchek, Meir, 4,433,051, Cl. 435-7.000.
Gilbertson, Thomas A. Oil well pump driving unit. 4,432,706, Cl. 417-399.000.
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., to Boots Company, The. Pesticide compounds, compositions and methods. 4,432,994, Cl. 424-300.000.
Giles, Harold F., Jr., to General Electric Company. Polyetherimide-fluorinated polyolefin blends. 4,433,104, Cl. 525-180.000.
Gilian Instrument Corporation: *See—*
Lalin, Hill S., 4,432,248, Cl. 73-863.030.
Gilleo, Margaret P., executrix: *See—*
Gualtieri, Devlin M.; Tumelty, Paul F.; and Gilleo, Mathias A., deceased, 4,433,034, Cl. 428-693.000.
Gilleo, Mathias A., deceased: *See—*
Gualtieri, Devlin M.; Tumelty, Paul F.; and Gilleo, Mathias A., deceased, 4,433,034, Cl. 428-693.000.
Gillette Company, The: *See—*
Kelly, John F., 4,432,452, Cl. 206-354.000.
Taylor, John B., 4,432,136, Cl. 30-32.000.
Gilpin, Jo Ann, to Dow Chemical Company, The. Inhibitors for furfurals. 4,433,155, Cl. 549-205.000.
Ginisty, Claude; Marteau, Michel; and Mauborgne, Bernard, to Commissariat a l'Energie Atomique. Uranium (VI) recovery process using acid organophosphorus extractant containing two or four alkoxyalkyl or aryloxyalkyl radicals. 4,432,946, Cl. 423-10.000.
Girodi, Erich: *See—*
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, 4,432,772, Cl. 48-66.000.
Gitman, Grigory M., to Cadre Corporation, The. Centralized ladle heating and drying system. 4,432,726, Cl. 432-9.000.
Givens, James R., to Hughes Aircraft Company. Compositions for use in heat-generating reactions. 4,432,818, Cl. 149-22.000.
Gjertsen, Robert K.; Wilson, John F.; and George, Raymond A., to Westinghouse Electric Corp. Displacer rod for use in a mechanical spectral shift reactor. 4,432,934, Cl. 376-333.000.
Glassco, Inc.: *See—*
Skipworth, Walter J., 4,432,278, Cl. 100-53.000.
Glawischnig, Wilfried: *See—*
Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, 4,432,284, Cl. 104-7.00R.
Glaxo Group Limited: *See—*
Jones, William R.; Trivedi, Harish S.; and Gane, Timothy L., 4,433,141, Cl. 544-25.000.
Gleinig, Harald: *See—*
Linhart, Karl; Gleinig, Harald; and Boehmke, Gunther, 4,432,899, Cl. 260-157.000.
Glennco Trust: *See—*
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, 4,432,922, Cl. 264-119.000.
Glienke, Gunter: *See—*
Klose, Reinhard; and Glienke, Gunter, 4,432,674, Cl. 406-19.000.
Gobel, Wilhelm: *See—*
Musch, Rudiger; Konter, Wolfgang; and Gobel, Wilhelm, 4,433,106, Cl. 525-215.000.
Godin, Pascal, to Societe Industrielle Auer. Gas- or liquid-fired hot water boiler. 4,432,307, Cl. 122-14.000.
Golding, Scott M., to Discovision Associates. High quality delta modulator. 4,433,423, Cl. 375-30.000.
Goldman, Ilan. Locking system for safes. 4,432,573, Cl. 292-37.000.
Goletto, Jean: *See—*
Pusineri, Christian; and Goletto, Jean, 4,433,072, Cl. 523-105.000.
Golly, Helmut: *See—*
Brass, Holger; Braunisch, Herbert; Disselbeck, Dieter; and Golly, Helmut, 4,432,413, Cl. 165-133.000.

Goodell, Paul D.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.
Goodyear Aerospace Corporation: *See*—
Crossman, Richard L., 4,432,440, Cl. 188-71.200.
Goranson, George G.: *See*—
Riise, H. Norman; Goranson, George G.; and Karwan, Henry P., 4,432,343, Cl. 126-424.000.
Goransson, Sture: *See*—
Adolfsson, Morgan; Brogardh, Torgny; Goransson, Sture; and Ovren, Christer, 4,433,238, Cl. 250-227.000.
Gorczyca, Thomas B.: *See*—
Bolon, Donald A.; and Gorczyca, Thomas B., 4,433,131, Cl. 528-185.000.
Gory Associated Industries, Inc.: *See*—
Pike, Robert D.; and Bobolts, Elroy F., 4,432,183, Cl. 52-533.000.
Goto, Sumio; Doi, Takeshi; and Sato, Kazuo, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Thermally reactive water-soluble blocked urethane prepolymer. 4,433,017, Cl. 528-45.000.
Goto, Tadahiko: *See*—
Hattori, Mitsuro; Harad, Koosuke; and Goto, Tadahiko, 4,432,245, Cl. 73-862.320.
Gotz, Wolfgang: *See*—
Siempelkamp, Dieter; and Gotz, Wolfgang, 4,432,828, Cl. 156-285.000.
Goudsmit, Johan H. Dental-care device and brush body suitable therefor. 4,432,114, Cl. 15-104.930.
Gouge, Howard W. Back washer. 4,432,113, Cl. 15-97.00R.
Gouker, Toby R.: *See*—
Euker, Charles A., Jr.; Wesselhoft, Robert D.; Dunkleman, John J.; Aquino, Dolores C.; and Gouker, Toby R., 4,432,773, Cl. 48-197.00R.
Gourdine, Meredith C., to Energy Innovations, Inc. Electrogasdynamic coating system. 4,433,003, Cl. 427-27.000.
Gowan, John G.; and Shillito, Keith R., to United States of America, Air Force. Laser mirror and method of fabrication. 4,433,045, Cl. 430-321.000.
Gowdy, Hugh W.; and Fenton, Donald M., to Union Oil Company of California. Method for removing hydrogen sulfide from gas streams. 4,432,962, Cl. 423-573.00R.
Gowing, James R., to EBSCO Industries, Inc. Fishing lure. 4,432,156, Cl. 43-42.310.
Gowing, James R., to EBSCO Industries, Inc. Fishing lure. 4,432,157, Cl. 43-42.310.
Goyne, Thomas E.: *See*—
Lobdell, Donn D.; and Goyne, Thomas E., 4,432,767, Cl. 604-86.000.
Graber, Joseph V. Vehicle attached carrier. 4,432,479, Cl. 224-322.000.
Grace Italiana S.p.A.: *See*—
Tegiacchi, Fabio; Chiruzzi, Mario; Casu, Benito; and Torri, Giangiacomo, 4,432,801, Cl. 106-92.000.
Gradin, James H.; and Joseph, John S., to Sundstrand Data Control, Inc. Automatic television antenna control system. 4,433,344, Cl. 358-181.000.
Graetz, Herbert; and Unterreiner, Ronald C., to Blair Industries, Inc. Method of making cassette holders. 4,432,827, Cl. 156-245.000.
Grage, Ludger; Ryseck, Werner; and Michl, Franz, to Siemens Aktiengesellschaft. Adjustment and testing device for a laser ranging system. 4,432,640, Cl. 356-5.000.
Graham, Henry A., Jr.: *See*—
Chang, Chi-Deu; and Graham, Henry A., Jr., 4,433,059, Cl. 436-512.000.
Graham, Ron: *See*—
Aparicio, Thomas, Jr.; and Graham, Ron, 4,432,256, Cl. 81-57.390.
Granat, Rodney J., to ACI Australia Limited. Displacement and/or force measuring device and method. 4,432,246, Cl. 73-862.530.
Granberg, Elof, to Granberg Pump & Meter Ltd. Garden tool with self-cleaning earth-working elements. 4,432,421, Cl. 172-375.000.
Granberg Pump & Meter Ltd.: *See*—
Granberg, Elof, 4,432,421, Cl. 172-375.000.
Granneman, George R.: *See*—
Nadzan, Alex M.; and Granneman, George R., 4,432,985, Cl. 424-267.000.
Gratec, Inc.: *See*—
Aparicio, Thomas, Jr.; and Graham, Ron, 4,432,256, Cl. 81-57.390.
Greaves, Brian; and Ingham, Paul, to Dearborn Chemicals, Ltd. Treatment of aqueous systems. 4,432,879, Cl. 210-699.000.
Green, Geoffrey F.; and Humphrey, James C., to United States of America, Navy. Piston sealing arrangement for a cryogenic refrigerator. 4,432,556, Cl. 277-73.000.
Greenbaum, George. Windbreaker. 4,432,381, Cl. 135-87.000.
Greenlee, Paul W., to General Electric Company. Method of locking conductors in a dynamoelectric machine rotor. 4,432,135, Cl. 29-598.000.
Greenlee, Paul W., to General Electric Company. Method of locking conductors in a dynamoelectric machine rotor and rotor having locked conductors. 4,433,262, Cl. 310-214.000.
Gregory, Edward W.; and Baer, Gregory G., to Exxon Production Research Co. Riser tensioner safety system. 4,432,420, Cl. 166-355.000.
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., to Georgetown University. Identification of materials using their complex dielectric response. 4,433,286, Cl. 324-61.00R.
Gregory, Willis H. Method and apparatus for efficiently capturing and distributing heat produced by gas logs. 4,432,337, Cl. 126-121.000.
Gresch, Heinz: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,432,776, Cl. 55-77.000.
Gretag Aktiengesellschaft: *See*—
Baschung, Michael, 4,432,637, Cl. 355-35.000.
Grether, Paul; Brader, Kurt; and Keller, Bruno, to Sulzer Brothers Limited. Self-supporting insulation element. 4,432,174, Cl. 52-222.000.
Grick, Shelly J.; and Beautz, Joseph A., to Gentex Corporation. Individually fitted helmet liner. 4,432,099, Cl. 2-412.000.
Griffin, Brian P.: *See*—
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., 4,433,083, Cl. 524-27.000.
Griffith, William M., to Koala Technologies Corporation. Hand controller multiple circuit switch. 4,433,217, Cl. 200-5.00R.
Groelinger, Howard, to M.J.H. Converters, Inc. Method of treating cellulose di-acetate fibers. 4,433,028, Cl. 428-378.000.
Groeneweg, Joost; and Schluter, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of treating agricultural wastes. 4,432,869, Cl. 210-602.000.
Grondin, Edward A. Apparatus and method for reducing waste in tufting. 4,432,296, Cl. 112-266.200.
Grosbois, Jean: *See*—
Bachot, Jean; and Grosbois, Jean, 4,432,860, Cl. 204-296.000.
Gross, Hansjurgen: *See*—
Moser, Gottfried; and Gross, Hansjurgen, 4,432,493, Cl. 237-12.30R.
Gross, James R.; and Bujan, Albert F., to Abbott Laboratories. Connecting device for medical liquid containers. 4,432,759, Cl. 604-411.000.
Grot, Walther G., to Du Pont de Nemours, E. I., and Company. Process for making liquid composition of perfluorinated ion exchange polymer, and product thereof. 4,433,082, Cl. 524-755.000.
Grove, Michael M., to Sundstrand Data Control, Inc. Ground proximity warning system with time and altitude based mode switching. 4,433,323, Cl. 340-970.000.
Gruber, Hermann: *See*—
Pedain, Josef; Wellner, Wolfgang; Konig, Klaus; and Gruber, Hermann, 4,433,010, Cl. 427-160.000.
Grup, Howard W., to General Electric Company. Viewing screen with enhanced contrast. 4,432,608, Cl. 350-128.000.
Grushkin, Harold. Pressure cuff tire pump device. 4,432,405, Cl. 152-424.000.
GTE Business Communication Systems Inc.: *See*—
Khan, Jawed M., 4,433,250, Cl. 307-66.000.
GTE Laboratories Incorporated: *See*—
McNeill, William H.; and Chen, Yung J., 4,432,614, Cl. 350-386.000.
GTE Products Corporation: *See*—
Bouchard, Andre C., 4,432,723, Cl. 431-359.000.
Bouchard, Andre C.; and Craig, Robert F., 4,432,724, Cl. 431-362.000.
Sindlinger, Ronald E., 4,432,725, Cl. 431-362.000.
Vanderpool, Clarence D.; Scheithauer, Richard A.; and Warmington, Richard G., 4,432,950, Cl. 423-61.000.
Gualtieri, Devlin M.; Tumelty, Paul F.; and Gilleo, Mathias A., deceased (by Gilleo, Margaret P., executrix), to Allied Corporation. Magnetic bubble layer of thulium-containing garnet. 4,433,034, Cl. 428-693.000.
Guerin, Michael N.: *See*—
Ostermeyer, Larry F.; and Guerin, Michael N., 4,433,084, Cl. 524-62.000.
Guiboro, Marcel. Sewer fluid trap. 4,432,384, Cl. 137-247.110.
Guillot, Francis. Device to promote the movement of buses by allocation of priority of crossing of an intersection controlled by traffic lights. 4,433,324, Cl. 340-923.000.
Gulf Research & Development Company: *See*—
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,433,197, Cl. 585-823.000.
Gulf South Research Institute: *See*—
Gettleman, Lawrence; Farris, Charles L.; Rawls, H. Ralph; and LeBouef, Ralph J., Jr., 4,432,730, Cl. 433-168.000.
Gullo, Vincent P.; Lam, Tony Y. K.; and Monaghan, Richard L., to Merck & Co., Inc. Hypocholesterolemic fermentation products and process of preparation. 4,432,996, Cl. 424-311.000.
Guma, Tesfa. Portable automatic carport. 4,432,581, Cl. 296-136.000.
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of producing silicon carbide bodies. 4,432,957, Cl. 423-345.000.
Gupta, Vijai P.; Melpolder, Frank W.; and Mameniskis, Walter A., to Atlantic Richfield Company. Acetophenone purification. 4,433,173, Cl. 568-324.000.
Gusev, Alexei I.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.
Guy, Andrew: *See*—
McFarlane, John; and Guy, Andrew, 4,432,332, Cl. 123-587.000.
Gyarmati, Erno: *See*—
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.

Haaf, William R.; Huebner, James A.; and Katchman, Arthur, to General Electric Company. Polyphenylene ether compositions and process. 4,433,088, Cl. 524-153.000.

Haars, Annegret; and Huttermann, Aloys, to Gesellschaft fur Biotechnologische Forschung. Process for producing a binder for wood materials. 4,432,921, Cl. 264-109.000.

Haas, David J. Light sensitive validating identification badge system. 4,432,630, Cl. 355-1.000.

Haber, Stephen B., to Du Pont de Nemours, E. I., and Company. Antiinflammatory and/or analgesic 2,3-diaryl-5-silyl thiophenes. 4,432,974, Cl. 424-184.000.

Hackbart, Reuben J., to Trane Company, The. Centrifugal pump impeller. 4,432,693, Cl. 415-88.000.

Hackforth GmbH & Co. KG: *See*—
Walter, Jurgen, 4,432,739, Cl. 464-24.000.

Hackler, Erich; Flockenhaus, Claus; and Lommerzheim, Werner, to Didier Engineering GmbH. Method for the preparation of high-caloric gases, particularly methane, by means of a catalyst fluidized bed. 4,433,066, Cl. 518-706.000.

Haddick, David H.; Lyon, George E.; and Menzimer, David A., to LogE/Dunn Instruments, Inc. Video image recording methods and devices. 4,433,345, Cl. 358-244.000.

Haendle, Joerg; and Alexandrescu, Mircea, to Siemens Aktiengesellschaft. Diagnostic x-ray installation for the representation of organs. 4,433,428, Cl. 378-95.000.

Hafele, Robert X., to Hoover Universal Inc. Apparatus for forming a blown thermoplastic article. 4,432,719, Cl. 425-526.000.

Hagen, Gary P., to Standard Oil Company (Indiana). Process for preparation of alpha, beta-unsaturated aldehydes using AMS-1B borosilicate crystalline molecular sieve. 4,433,174, Cl. 568-459.000.

Hagimori, Kenji: *See*—
Kuwayama, Kenta; Nakagawa, Junzo; Tomii, Keishi; and Hagimori, Kenji, 4,432,937, Cl. 420-513.000.

Hagiwara, Toshio: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,432,854, Cl. 204-206.000.

Hahn & Clay: *See*—
Pechacek, Raymond E.; and Clay, Eugene J., 4,432,128, Cl. 29-429.000.

Haidt, Elaine: *See*—
Haidt, Jonathan D.; and Haidt, Elaine, 4,432,477, Cl. 224-222.000.

Haidt, Jonathan D.; and Haidt, Elaine. Carrier for music player. 4,432,477, Cl. 224-222.000.

Haigh, Daniel H.: *See*—
Page, Judith L.; Haigh, Daniel H.; and Peters, James, 4,432,968, Cl. 424-81.000.

Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,432,448, Cl. 198-735.000.

Halliburton Company: *See*—
Bridges, James R., 4,432,929, Cl. 376-119.000.
Streich, Steven G., 4,432,419, Cl. 166-188.000.

Halomet, Incorporated: *See*—
Aldrich, Robert G., 4,432,868, Cl. 209-172.500.

Halvorsen, Kenneth G., to Medi-Tech, Incorporated. Electromagnetic sensor having three electrodes for measuring signals indicative of a biologic condition. 4,432,369, Cl. 128-653.000.

Hamabe, Takeshi; and Nakamura, Tatsuya, to Matsushita Electric Industrial Co., Ltd. Metallized film capacitors. 4,433,359, Cl. 361-273.000.

Hamada, Yoshio: *See*—
Nashiki, Masayuki; and Hamada, Yoshio, 4,433,261, Cl. 310-156.000.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Shimada, Mitsuhiro, 4,433,236, Cl. 250-213.0VT.

Hamamoto, Toshikazu; and Sugise, Ryoji, to UBE Industries, Ltd. Method for preparing an ester of nitroacetic acid. 4,433,162, Cl. 560-156.000.

Hamamura, Kimio; Akasaka, Kozo; and Yamagishi, Youji, to Eisai Co., Ltd. Synthesis of optically active d-alpha tocopherol. 4,433,159, Cl. 549-411.000.

Hamaoka, Kiyohiko: *See*—
Kondo, Toshiro; and Hamaoka, Kiyohiko, 4,432,428, Cl. 180-73.00D.

Hambrecht, Juergen: *See*—
Brandstetter, Franz; Hambrecht, Juergen; and Stephan, Rudolf, 4,433,102, Cl. 525-75.000.

Hammer, James L.: *See*—
Bevans, Terry D.; and Hammer, James L., 4,432,531, Cl. 254-100.000.

Hanada, Masamichi: *See*—
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.

Hanazawa, Toshio: *See*—
Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, 4,433,306, Cl. 330-297.000.

Handa, Harumi: *See*—
Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, 4,433,306, Cl. 330-297.000.

Handte, Reinhard: *See*—
Knorr, Harald; Handte, Reinhard; Willms, Lothar; and Tammer, Thomas, 4,433,153, Cl. 548-152.000.

Hanford Pty., Ltd.: *See*—
Boot, Phillip H., 4,432,171, Cl. 52-79.100.

Hanno, Kenji: *See*—
Kawasaki, Yoshinari; and Hanno, Kenji, 4,432,884, Cl. 252-180.000.

Hansen, Christian B., to Danfoss A/S. Internally shafted planetary piston engine. 4,432,709, Cl. 418-61.00B.

Hansen, Christian B.; and Flagstad, Carl O., to Danfoss A/S. Rotary type machine with check valves for relieving internal pressures. 4,432,710, Cl. 418-61.00B.

Hanson, Merlin L.; Swenson, Robert E.; and Schmalzbauer, Arnold R., to Sperry Corporation. Cache/disk subsystem with cache bypass. 4,433,374, Cl. 364-200.000.

Harad, Koosuke: *See*—
Hattori, Mitsuro; Harad, Koosuke; and Goto, Tadahiko, 4,432,245, Cl. 73-862.320.

Harada, Katsuhito: *See*—
Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, 4,432,643, Cl. 356-312.000.

Harada, Masahiro: *See*—
Miyamoto, Akira; Shimizu, Senzo; Yamamiya, Kazuo; and Harada, Masahiro, 4,433,136, Cl. 528-347.000.

Harata, Kazuaki; Morimoto, Satoshi; and Tsuda, Keishiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Inclusion compound-containing composite. 4,432,802, Cl. 106-163.00R.

Harbert, Charles A.: *See*—
Welch, Willard M.; and Harbert, Charles A., 4,432,978, Cl. 424-249.000.

Harman, Geoffrey E.; and James, Malcolm J. F., to Rolls-Royce Limited. Temperature sensor. 4,432,658, Cl. 374-138.000.

Harper, Jack R., to Dow Corning Corporation. Method for preparing flame resistant polysiloxane foams and foams prepared thereby. 4,433,069, Cl. 521-99.000.

Harper, Stephen M.; and Stultz, Jeffrey H., to Dow Chemical Company, The. Liquid distributing apparatus and method for a liquid-vapor contact column. 4,432,913, Cl. 261-97.000.

Harrar, Jackson E.: *See*—
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,432,902, Cl. 260-239.0HM.

Harris, Alva F., to Monsanto Company. Heat stabilized polymers. 4,433,086, Cl. 524-112.000.

Harris, Bernard; and Klein, Howard J., to Cabot Corporation. ESR Hollows molten metal/slag interface detection. 4,433,242, Cl. 250-358.100.

Harris, Clifford J.; and Barraclough, Paul, to Wellcome Foundation Ltd., The. Anti-thrombotic diazabicyclooctanediones. 4,432,988, Cl. 424-273.00R.

Harris Corporation: *See*—
Patel, Vipin N.; and Conarroe, John L., Jr., 4,433,342, Cl. 357-2.000.

Harris, Gerald R.: *See*—
DeReggi, Aime' S.; and Harris, Gerald R., 4,433,400, Cl. 367-163.000.

Harrison & Jones (Brookside) Limited: *See*—
Sutton, James B., 4,432,110, Cl. 5-481.000.

Harsanyi, Kalman: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.

Hartman, Charles R.: *See*—
Akers, Roy; Hartman, Charles R.; and Deutch, Keith B., 4,432,540, Cl. 271-8.00A.

Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., to Eastman Kodak Company. Cycloalkylsulfonates, polymers and processes relating to same. 4,433,130, Cl. 528-173.000.

Hartman, Wayne E., to J. I. Case Company. PIO Master shield. 4,432,742, Cl. 464-176.000.

Hartmann, Heinrich: *See*—
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,433,112, Cl. 525-326.900.

Hartmann, Werner, to Kusters, Eduard. Pressure rolling nip line pressure control. 4,432,277, Cl. 100-37.000.

Harvey, Douglass C., to Eastman Kodak Company. Film and paper assembly for film cartridges. 4,432,625, Cl. 354-275.000.

Harvey Hubbell Incorporated: *See*—
Wuertz, Emil S., 4,432,465, Cl. 220-235.000.
Wuertz, Emil S., 4,433,204, Cl. 174-48.000.

Hasegawa, Toyofumi: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.

Hashimoto, Takashi: *See*—
Nakamura, Shiro; Nakagawa, Yoshihiro; and Hashimoto, Takashi, 4,433,032, Cl. 428-682.000.

Hasler, Rolf; Henzi, Beat; Schnider, Ernst; and Ulshoefer, Hermann, to Sandoz Ltd. Rapid dyeing of polyester fibers with a mixture of disperse dyes. 4,432,770, Cl. 8-638.000.

Hass, Robert H.; and Ward, John W., to Union Oil Company of California. Catalyst and process for oxidizing hydrogen sulfide. 4,432,961, Cl. 423-542.000.

Hattori, Iwakazu: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, 4,433,109, Cl. 525-314.000.

Hattori, Mitsuro; Harad, Koosuke; and Goto, Tadahiko, to Agency of Industrial Science & Technology. Grinding machine motor with a torque sensor. 4,432,245, Cl. 73-862.320.

Hauber, Jack R.: *See*—
Stoffel, James C.; Seachman, Ned J.; Hauber, Jack R.; and Kingsley, William, 4,433,346, Cl. 358-293.000.
Hauser, Kurt, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,432,444, Cl. 192-58.00B.
Hawes, David H., to Westvaco Corporation. Discontinuous fiber pretreatment. 4,433,074, Cl. 523-207.000.
Hawes, David J., to Aviation Electric Ltd. Acceleration limit reset. 4,432,201, Cl. 60-39.161.
Hayashi, Masahiro: *See*—
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,432,908, Cl. 260-465.00D.
Hayashi, Yoshimasa: *See*—
Ogawa, Atsushi; and Hayashi, Yoshimasa, 4,433,433, Cl. 381-7.000.
Hayes, Harry, to Colgate-Palmolive Company. Two phase product dispenser. 4,432,471, Cl. 222-136.000.
Hayes, John M.; and Small, Gerald J., to United States of America, Energy. Detection system for a gas chromatograph. 4,432,225, Cl. 73-23.100.
Health-Ex Corporation: *See*—
Scarberry, Walter P.; and Vollman, Charles K., 4,432,826, Cl. 156-244.110.
Hearn, Eric W.: *See*—
Chye, Patrick W.; Hearn, Eric W.; Kulkarni, Murlidhar V.; and Markovits, Gary, 4,432,809, Cl. 148-1.500.
Hebert, Carlton A. Solid fuel burning heating system. 4,432,339, Cl. 126-368.000.
Heck, Ronald M.: *See*—
Eleazar, Antonio E.; Heck, Ronald M.; Dettling, Joseph C.; and Lui, Yiu-Kwan, 4,433,191, Cl. 585-671.000.
Heesch, Max O.: *See*—
Russo, Vincenzo; and Heesch, Max O., 4,432,583, Cl. 297-330.000.
Heikkinen, Urho, to Kone Oy. Procedure and apparatus for barking timber. 4,432,403, Cl. 144-342.000.
Heinecke, Rudolf A. H.; and Stern, Ronald C., to ITT Industries, Inc. Process for the pyrolytic deposition of aluminum from TIBA. 4,433,012, Cl. 427-252.000.
Heitkamp, Herbert: *See*—
Stuckmann, Dieter; and Heitkamp, Herbert, 4,432,665, Cl. 405-143.000.
Helferich, Richard L.; and Shook, William B., to Duriron Company, Inc., The. Aluminosilicate hydrogel bonded aggregate articles. 4,432,798, Cl. 106-38.300.
Helffer, Bernard: *See*—
Rainin, Jean-Pierre; Helffer, Bernard; and Chirouze, Jean L., 4,432,295, Cl. 112-262.300.
Helmer, Wayne A.: *See*—
Chen, Peter Y. S.; Helmer, Wayne A.; and Rosen, Howard N., 4,432,147, Cl. 34-46.000.
Heninger, Byrne: *See*—
Bachman, Gilbert; and Heninger, Byrne, 4,432,153, Cl. 40-324.000.
Henke, Steven J.: *See*—
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Cole, Billy W., 4,432,311, Cl. 123-90.670.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Bahn, Michael; Preuss, Wolfgang; Schmid, Rolf; and Wagner, Rudiger, 4,432,905, Cl. 260-397.100.
Henkeniefken, Larry L.; Pettit, Douglas L.; and Barry, Gerald E., to Owatonna Manufacturing Company, Inc. Portable feed grinder-mixer. 4,432,499, Cl. 241-30.000.
Henrich, Edmund; and Schlich, Elmar, to Kernforschungszentrum Karlsruhe GmbH; and Nukem GmbH. Process for desorbing fission iodine from nitric acid fuel solution. 4,432,955, Cl. 423-249.000.
Henze, Helmut; and Capell, Ronald, to Schering Aktiengesellschaft. Method of manufacturing printed circuits. 4,433,009, Cl. 427-97.000.
Henzi, Beat: *See*—
Hasler, Rolf; Henzi, Beat; Schnider, Ernst; and Ulshoefer, Hermann, 4,432,770, Cl. 8-638.000.
Herbertz, Toni: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,432,923, Cl. 264-206.000.
Herion-Werke KG: *See*—
Ott, Helmut, 4,432,391, Cl. 137-625.640.
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, to Siemens Aktiengesellschaft. Method for detecting breakdowns in an electrostatic filter. 4,433,281, Cl. 323-246.000.
Hermle, Rolf; Kammerer, Heinz; and Langheinrich, Hans, to Gebhard Balluff Fabrik Feinmechanischer. Proximity switch with built-in test circuit. 4,433,309, Cl. 331-65.000.
Herrington, Daniel R.; and Kuch, Philip L., to Standard Oil Co., The. Thermochemical method for producing hydrogen from hydrogen sulfide. 4,432,960, Cl. 423-539.000.
Herzog, Peter: *See*—
Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, 4,432,320, Cl. 123-357.000.
Hesselschwerdt, Bernhard, to Bulova Watch Company, Inc. Wrist watch case and metal bracelet assembly. 4,432,654, Cl. 368-282.000.
Hettinger, William P., Jr.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Myers, George D., deceased; Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., 4,432,863, Cl. 208-113.000.
Heubusch, Henry P., to Textron Inc. Treatment of stainless steel apparatus used in the manufacture, transport or storage of nitrogen oxides. 4,432,808, Cl. 134-3.000.
Hewell, Gerald M., to Royston Manufacturing Corporation. Outdoor telephone booth. 4,432,170, Cl. 52-28.000.
Heytmeijer, Herman R., to U.S. Philips Corporation. Recovery of yttrium and europium from contaminated solutions. 4,432,948, Cl. 423-21.500.
Hicks, Robert A.: *See*—
Dyer, Robert E.; Swanson, Scott C.; and Hicks, Robert A., 4,433,387, Cl. 364-900.000.
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., to Emerson Electric Co. Silicon carbide heating elements. 4,433,233, Cl. 219-553.000.
Higashiguti, Teruaki: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,433,039, Cl. 430-58.000.
High Voltage Engineering Corporation: *See*—
Albrecht, Leland J.; and Briere, Richard L., 4,432,250, Cl. 73-864.340.
Higo, Nobumasa: *See*—
Kataoka, Masami; and Higo, Nobumasa, 4,432,244, Cl. 73-861.770.
Hilaire, Pierre; Lietaert, Franz; Staroz, Claude; and Schumacher, Walter, to Societe Nobel Bozel. Ferroalloy for the treatment of cast metals and process. 4,432,793, Cl. 75-130.00R.
Hillwood Corporation: *See*—
Snyder, Thomas A.; and Leible, Walter T., 4,432,749, Cl. 604-2.000.
Hilpert, Patrik: *See*—
Ruf, Hans R.; Quattlander, Rolf; Reichlin, Max; and Hilpert, Patrik, 4,432,380, Cl. 134-104.000.
Hilti Aktiengesellschaft: *See*—
Eble, Monika; and Lang, Gusztav, 4,432,469, Cl. 222-134.000.
Hilty, John R.: *See*—
Evans, Alyce D.; and Hilty, John R., 4,432,721, Cl. 431-4.000.
Hinoda, Yuji; and Enmoto, Kazuhiro, to Fujisash Company. Process for regeneration of electrolyte containing tin salts by reducing the same. 4,432,844, Cl. 204-54.00R.
Hinton, Brian J.: *See*—
Bohan, John E., Jr.; and Hinton, Brian J., 4,432,722, Cl. 431-46.000.
Hioki Denki Kabushiki Kaisha: *See*—
Sakaguchi, Takehiko, 4,433,339, Cl. 346-78.000.
Hiraga, Masaharu; and Sakamoto, Seiichi, to Sanden Corporation. Scroll type fluid displacement apparatus with pressure communicating passage between pockets. 4,432,708, Cl. 418-55.000.
Hirai, Kentaro, to Shionogi & Company, Limited. Bis(carboxamide) derivatives. 4,433,154, Cl. 548-195.000.
Hirakata, Kaoru: *See*—
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,432,856, Cl. 204-237.000.
Hirata, Hitoshi, to Pioneer Electronic Corporation. PLL Detection circuit. 4,433,308, Cl. 331-17.000.
Hirata, Yasushi: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.
Hiratake, Susumu: *See*—
Adachi, Toshio; and Hiratake, Susumu, 4,432,942, Cl. 422-159.000.
Hiratani, Kazuhisa, to Director-General of Agency of Industrial Science & Technology. Oxy benzoic acid terminated polyether derivatives of 8-hydroxy quinolines. 4,433,151, Cl. 546-178.000.
Hirayama, Keizo: *See*—
Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, 4,433,229, Cl. 219-84.000.
Hirayama, Masaru; Anzai, Nobuaki; and Shirouzu, Ryusuke, to Alps Electric Co., Ltd. Variable resistor. 4,433,322, Cl. 338-162.000.
Hislop, Alfred R.; and Rubin, David, to United States of America, Navy. Millimeter wave suspended substrate multiplexer. 4,433,314, Cl. 333-110.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Tachikawa, Hajime; and Ohkawa, Shuji, 4,433,232, Cl. 219-502.000.
Hitachi Koki Company, Limited: *See*—
Saito, Takayasu, 4,432,849, Cl. 204-180.00R.
Hitachi, Ltd.: *See*—
Akiyama, Nobuyuki; Ohshima, Yoshimasa; and Koizumi, Mitsuyoshi, 4,433,235, Cl. 250-201.000.
Inoue, Yoichi; Terayama, Takao; Kasai, Susumu; and Tominaga, Tamotsu, 4,432,508, Cl. 242-195.000.
Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, 4,432,894, Cl. 252-632.000.
Kaneko, Kenji; Okabe, Takahiro; Nagata, Minoru; and Okada, Yutaka, 4,433,258, Cl. 307-456.000.
Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, 4,432,643, Cl. 356-312.000.
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, 4,432,216, Cl. 62-514.00R.
Miura, Haruo; and Abe, Yoshiaki, 4,432,697, Cl. 416-198.00A.
Nakamura, Kazumitsu; and Miyazaki, Masaru, 4,433,243, Cl. 250-397.000.

Nii, Katsutoshi; Okano, Kinpei; Doi, Motomichi; and Kitsuya, Minoru, 4,433,432, Cl. 378-193.000.
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Ogawa, Soichiro, 4,433,272, Cl. 315-290.000.
Oishi, Tetsu; Oda, Makoto; and Futaki, Hisao, 4,432,211, Cl. 62-155.000.
Okuyama, Nobutaka; Shimizu, Toshiharu; and Naito, Yoshikazu, 4,433,318, Cl. 335-213.000.
Shida, Shigeru; Hosaka, Nobuyoshi; Ishikawa, Yuichi; and Nishida, Osamu, 4,433,093, Cl. 524-433.000.
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,432,212, Cl. 62-229.000.
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,433,394, Cl. 365-221.000.

Hitachi Metals, Ltd.: *See*—
Kawanishi, Tsuneaki; Mukoh, Akio; Morishita, Hirosada; and Hoshi, Nobuyoshi, 4,433,042, Cl. 430-126.000.
Yamashita, Keitaro, 4,433,041, Cl. 430-122.000.

Hitzrot, Henry W., Jr., to Bethlehem Steel Corporation. Iron oxide paint pigment precursor. 4,432,803, Cl. 106-304.000.

Hizuka, Kenji: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, 4,432,842, Cl. 204-41.000.

Hoary, Marto J., to Institute for Industrial Research and Standards. Vaginal speculum. 4,432,351, Cl. 128-17.000.

Hodogaya Chemical Company, Ltd.: *See*—
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Hoechst AG: *See*—
Brass, Holger; Braunisch, Herbert; Disselbeck, Dieter; and Golly, Helmut, 4,432,413, Cl. 165-133.000.
Schubert, Hans; and Baessler, Konrad, 4,433,168, Cl. 564-309.000.

Hoechst Aktiengesellschaft: *See*—
Knorr, Harald; Handte, Reinhard; Willms, Lothar; and Tammer, Thomas, 4,433,153, Cl. 548-152.000.
von Werner, Konrad, 4,433,180, Cl. 568-684.000.
Wiezer, Hartmut; and Pfahler, Gerhard, 4,433,145, Cl. 544-198.000.

Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of olefins from methanol and/or dimethyl ether. 4,433,188, Cl. 585-640.000.

Hoener, Jost. Locking key with memory. 4,432,218, Cl. 70-395.000.

Hoffmann, Alexander: *See*—
Pusch, Gunter; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,433,025, Cl. 428-207.000.

Hoffmann, Ernst H.; and Arendt, Hans F., to Estel-Hoesch Werke Aktiengesellschaft. Procedure for washing clothes. 4,432,111, Cl. 8-158.000.

Hoffmann-La Roche Inc.: *See*—
Cohen, Noal; and Weber, Giuseppe, 4,432,906, Cl. 260-410.90R.
Petrzilka, Martin; and Schleich, Kuno, 4,432,885, Cl. 252-299.610.
Tarnowski, Stanley J., 4,432,895, Cl. 260-112.00R.

Hofmeister, Helmut: *See*—
Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, 4,432,976, Cl. 424-241.000.

Hofstadter, Robert: *See*—
Hughes, E. Barrie; Rubenstein, Edward; and Hofstadter, Robert, 4,432,370, Cl. 128-654.000.

Hogan, Lawrence R., to Baxter Travenol Laboratories, Inc. Apparatus for irradiating tubing connections. 4,433,244, Cl. 250-455.100.

Hogervorst, Johannes R.: *See*—
Westra, Simon; and Hogervorst, Johannes R., 4,432,671, Cl. 405-226.000.

Hohman, Charles M.: *See*—
Propster, Mark A.; Hohman, Charles M.; and Streicher, William L., 4,432,780, Cl. 65-2.000.

Hohnishi, Satoru: *See*—
Abe, Takao; and Hohnishi, Satoru, 4,433,050, Cl. 430-542.000.

Holcroft & Company: *See*—
Jayaraman, Viswanath; and Shah, Mahendra R., 4,432,791, Cl. 75-65.00R.

Holdschlag, Heinrich. Support for the constuction of buildings. 4,432,184, Cl. 52-732.000.

Holleck, Helmut, to Kernforschungszentrum Karlsruhe GmbH. Hard alloy comprising one or more hard phases and a binary or multicomponent binder metal alloy. 4,432,794, Cl. 75-239.000.

Holt, Curtis, Jr.: *See*—
Fraser, Bruce A.; and Holt, Curtis, Jr., 4,432,705, Cl. 417-295.000.

Holt, Jon R. Foldable grid for cooker. 4,432,334, Cl. 126-9.00B.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Holter, Heinz. Process for filtering separators in dry chemisorption. 4,432,776, Cl. 55-77.000.

Holter, Samuel N., to Koppers Company, Inc. Process for recovering a crystallization medium. 4,433,181, Cl. 568-750.000.

Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Cole, Billy W., to Standard Oil Company (Indiana). Composite valve spring retainer and process. 4,432,311, Cl. 123-90.670.

Holtzberg, Matthew W.; and Spaulding, Lawrence D., to Standard Oil Company, (Indiana). Composite piston ring and process. 4,432,925, Cl. 264-235.000.

Hombach, Rudolf; Reiff, Helmut; Wenzel, Wolfgang; and Dollhausen, Manfred, to Bayer Aktiengesellschaft. Aqueous adhesives containing water-dispersible polyisocyanate preparations. 4,433,095, Cl. 524-563.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,432,205, Cl. 60-605.000.

Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, to Fujitsu Limited. Audio-frequency power amplifier. 4,433,306, Cl. 330-297.000.

Honecker, Guter: *See*—
Abels, Theodor; and Honecker, Guter, 4,432,424, Cl. 180-6.480.

Honerkamp, Joseph D.; and Ebeling, Harold O., to Latoka Engineering, Inc. System of gas dehydration using liquid desiccants. 4,432,779, Cl. 55-233.000.

Honeycutt, LeRoy, III, to National Steel Corporation. Cleaning and treatment of etched cathode aluminum capacitor foil. 4,432,846, Cl. 204-129.950.

Honeywell, Edward W.; and Honeywell, Joseph C. Lead tape puller and method. 4,432,505, Cl. 242-56.00R.

Honeywell Inc.: *See*—
Bohan, John E., Jr.; and Hinton, Brian J., 4,432,722, Cl. 431-46.000.
Horning, Robert J.; and Eppley, William J., 4,433,036, Cl. 429-114.000.
Kitchen, Robert D., 4,433,224, Cl. 200-330.000.

Honeywell Information Systems Inc.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.

Honeywell, Joseph C.: *See*—
Honeywell, Edward W.; and Honeywell, Joseph C., 4,432,505, Cl. 242-56.00R.

Honzawa, Yatsuhiro; Moriyama, Masuyoshi; and Iwamori, Hidekazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor. 4,432,702, Cl. 417-269.000.

Hooper, George D., to Electric Power Research Institute, Inc. Radiant heat shield for a superconducting generator. 4,432,411, Cl. 165-47.000.

Hooser, Oneida O. Bathroom accessory. 4,432,451, Cl. 206-216.000.

Hoover Universal Inc.: *See*—
Hafele, Robert X., 4,432,719, Cl. 425-526.000.

Hopley, Robert J.; and van der Westhuizen, Wynand J., to Boart International, Limited. Borehole guide and method of boring interpenetrating holes. 4,432,422, Cl. 175-61.000.

Hoppe, Bernd: *See*—
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, 4,432,199, Cl. 57-294.000.

Horiuchi, Susumu: *See*—
Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, 4,432,894, Cl. 252-632.000.

Horning, Robert J.; and Eppley, William J., to Honeywell Inc. Multicell reserve battery. 4,433,036, Cl. 429-114.000.

Hornyak, Gyula: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.

Hosaka, Nobuyoshi: *See*—
Shida, Shigeru; Hosaka, Nobuyoshi; Ishikawa, Yuichi; and Nishida, Osamu, 4,433,093, Cl. 524-433.000.

Hoshi, Nobuyoshi: *See*—
Kawanishi, Tsuneaki; Mukoh, Akio; Morishita, Hirosada; and Hoshi, Nobuyoshi, 4,433,042, Cl. 430-126.000.

Hoshika, Shuji: *See*—
Itoh, Kiyoshi; Nishikawa, Yukiyasu; Hoshika, Shuji; and Okamoto, Ikuzo, 4,432,617, Cl. 351-211.000.

Hosokawa, Tatsuhiro: *See*—
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.

Hospal-Sodip, S.A.: *See*—
Pusineri, Christian; and Goletto, Jean, 4,433,072, Cl. 523-105.000.

Houdaille Industries, Inc.: *See*—
Schultz, John C., 4,432,116, Cl. 16-35.00D.
Schultz, John C., 4,432,254, Cl. 74-574.000.

Howe, Gary L.; and Koutavas, Samuel G., to Future Tech, Inc. Solar heater and roof attachment means. 4,432,341, Cl. 126-417.000.

Howell, Edward K., to General Electric Company. Power line communication system using the neutral and ground conductors of a residential branch circuit. 4,433,326, Cl. 340-310.00A.

Hoyen, Harry A.: *See*—
Silverman, Robert A.; and Hoyen, Harry A., 4,433,047, Cl. 430-409.000.

HRI, Inc.: *See*—
Huibers, Derk T. A.; Chao, James C.; and Shah, Rajni C., 4,433,184, Cl. 568-863.000.

Hsiao, Charles: *See*—
Keith, Alec D.; and Hsiao, Charles, 4,432,965, Cl. 424-19.000.

Hsu, Oscar H. H.; and Tassler, Milford C., to Masonite Corporation. Modified phenol-formaldehyde resin and the production thereof. 4,433,126, Cl. 527-105.000.

Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Recovery of cobalt, molybdenum, nickel and vanadium from an aqueous ammonia and ammonium salt solution by precipitating vanadium and subsequent serial ion exchange. 4,432,949, Cl. 423-54.000.

Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Leaching cobalt from spent hydroprocessing catalysts with sulfur dioxide. 4,432,953, Cl. 423-140.000.

Huck Manufacturing Company: *See*—
Angelosanto, Donald J.; and Kendall, James W., 4,432,679, Cl. 411-34.000.

Hudson, Alice: *See*—
Woodward, Fred E.; and Hudson, Alice, 4,433,113, Cl. 525-327.500.

Huebner, James A.: *See*—
Haaf, William R.; Huebner, James A.; and Katchman, Arthur, 4,433,088, Cl. 524-153.000.

Hug, Peter: *See*—
Buhler, Anton; and Hug, Peter, 4,433,220, Cl. 200-144.0AP.

Hughes Aircraft Company: *See*—
Blair, G. Richard, 4,432,606, Cl. 350-96.330.
Givens, James R., 4,432,818, Cl. 149-22.000.

Hughes, E. Barrie; Rubenstein, Edward; and Hofstadter, Robert, to Leland Stanford Junior University, The Board of Trustees of the. Method and means for minimally invasive angiography using monochromatized synchrotron radiation. 4,432,370, Cl. 128-654.000.

Hughes, Lorenzo; and Richardson, Kenneth R., to Imperial Chemical Industries PLC. Fermentation process for the production of poly(β-hydroxy butyric acid). 4,433,053, Cl. 435-141.000.

Huhn, Karl: *See*—
Marwitz, Heinrich; Ullrich, Kurt; and Huhn, Karl, 4,433,007, Cl. 427-54.100.

Huibers, Derk T. A.; Chao, James C.; and Shah, Rajni C., to HRI, Inc. Multi-stage catalytic conversion of aldoses to alditols. 4,433,184, Cl. 568-863.000.

Humphrey, James C.: *See*—
Green, Geoffrey F.; and Humphrey, James C., 4,432,556, Cl. 277-73.000.

Hungerford, Gordon P., to Mobil Oil Corporation. Method for improving thickness uniformity of stretch oriented polyacrylonitrile film. 4,432,917, Cl. 264-40.100.

Hunter, Richard E. Self-steerable wheel assembly for irrigation systems. 4,432,494, Cl. 239-177.0CC.

Hunziker, Walter. Steam bath apparatus and liquid or steam treatment equipment. 4,432,103, Cl. 4-525.000.

Hurst, Fred J.; Brown, Gilbert M.; and Posey, Franz A., to United States of America, Energy. Removing oxygen from a solvent extractant in an uranium recovery process. 4,432,945, Cl. 423-10.000.

Huspeni, Paul J., to Conwed Corporation. Plastic support platform for mattress structure. 4,432,109, Cl. 5-478.000.

Hustig, Charles: *See*—
Moses, Donald W.; Hustig, Charles; and Ballard, C. Ray, 4,433,212, Cl. 179-2.00C.

Huszar, Gabor B. Method for determining the extensibility of selected non-excised tissue of the uterine cervix, ear or skin. 4,432,376, Cl. 128-774.000.

Hutchinson, Paul; and Serginson, Alan, to Can-Gun Limited. Handle and actuating device for pressurized dispensers. 4,432,474, Cl. 222-402.150.

Hutchison, Wayne R.; and Meylink, John G., to Deere & Company. Cooling system for air-cooled engine. 4,432,309, Cl. 123-41.660.

Huttermann, Aloys: *See*—
Haars, Annegret; and Huttermann, Aloys, 4,432,921, Cl. 264-109.000.

Ibuki, Seiro: *See*—
Tamura, Hideo; and Ibuki, Seiro, 4,432,804, Cl. 106-306.000.

Ichida, Toshio: *See*—
Ogata, Hajime; Ichida, Toshio; Tsugawa, Shunichi; and Irie, Toshio, 4,432,845, Cl. 204-56.00R.

Ichikawa, Osamu: *See*—
Sadamasa, Tetsuo; and Ichikawa, Osamu, 4,432,131, Cl. 29-569.00L.

Ichinohe, Shoji; Takahashi, Kouzou; and Tanaka, Yasuharu, to Shin-Etsu Chemical Co., Ltd.; and Toyo Contact Lens Co., Ltd. Oxygen permeable hard contact lens. 4,433,125, Cl. 526-279.000.

Icking, Friedrich, to Westfalia Separator AG. Milk pumping system for vacuum milking installations. 4,432,700, Cl. 417-121.000.

ICN Pharmaceuticals, Inc.: *See*—
Libby, Alfred F., 4,432,975, Cl. 424-201.000.

Idel, Karsten; Freitag, Dieter; Bottenbruch, Ludwig; and Neuner, Otto, to Bayer Aktiengesellschaft. Process for the preparation of polyarylene sulphides. 4,433,138, Cl. 528-388.000.

Idento-Gesellschaft fur Industrielle Kennzeichnung mbH: *See*—
Breuers, Manfred O., 4,432,124, Cl. 29-235.000.

Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, to Mitsui Toatsu Chemicals, Inc. Process for producing crosslinked urea-formaldehyde polymer particles. 4,433,133, Cl. 528-232.000.

Igarashi, Hitoshi: *See*—
Kubo, Yoshimi; Shimizu, Shigeaki; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,432,935, Cl. 419-2.000.

Igelbuscher, Heinrich: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,432,776, Cl. 55-77.000.

Iguchi, Kouichi: *See*—
Shimizu, Seiichi; and Iguchi, Kouichi, 4,432,328, Cl. 123-516.000.

Iguchi, Osamu: *See*—
Shirakuma, Takashi; Nakamichi, Fujio; and Iguchi, Osamu, 4,432,698, Cl. 417-27.000.

Iijima, Yoshio, to Daido Metal Co. Ltd. Method for producing a connecting rod for a radial piston motor. 4,432,122, Cl. 29-156.50A.

Iizuka, Masahiko; Kubota, Hidenobu; and Sano, Emiko, to Toray Industries, Incorporated. Process for producing interferon. 4,433,052, Cl. 435-68.000.

Ikeda, Hiroaki: *See*—
Akanabe, Yuichi; Ikeda, Hiroaki; Maeda, Masatoshi; and Funaki, Shinsuke, 4,432,598, Cl. 350-6.700.

Ikeda, Isamu: *See*—
Ueda, Yutaka; and Ikeda, Isamu, 4,432,197, Cl. 57-261.000.

Ikeda, Shinichi: *See*—
Aoyagi, Akira; and Ikeda, Shinichi, 4,433,293, Cl. 324-424.000.

Ikegami, Mikihiko: *See*—
Ogawa, Masaki; and Ikegami, Mikihiko, 4,433,094, Cl. 524-496.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Zoom lens. 4,432,615, Cl. 350-427.000.

Ima, Seiichiro: *See*—
Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, 4,433,110, Cl. 525-323.000.

Imagome, Hiroshi: *See*—
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Imai, Hirosuke: *See*—
Itoh, Hiroyuki; Yamansshi, Teruaki; and Imai, Hirosuke, 4,433,098, Cl. 524-811.000.

Imamura, Junji; and Matsumura, Kaname, to Mitsuboshi Belting Ltd. Power transmission belt. 4,432,744, Cl. 474-238.000.

Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Ltd. Three-dimensional tracer control system. 4,433,275, Cl. 318-578.000.

Imperial Chemical Industries PLC: *See*—
Barnard, John; and Padanyi, Sandor Z. M., 4,432,928, Cl. 264-519.000.
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., 4,433,083, Cl. 524-27.000.
Hughes, Lorenzo; and Richardson, Kenneth R., 4,433,053, Cl. 435-141.000.
Kay, Ian T.; and Noon, Robert A., 4,432,784, Cl. 71-88.000.
Rose, John B.; and Cinderey, Michael B., 4,433,172, Cl. 568-319.000.
Stanier, Colin S., 4,432,857, Cl. 204-253.000.

Imperial Clevite Inc.: *See*—
Andersen, Phillip J., 4,432,795, Cl. 75-245.000.

Imperial Metal Industries (Kynoch) Limited: *See*—
Carter, George B.; and Cross, Alan, 4,432,819, Cl. 149-45.000.

Impink, Albert J., Jr., to Westinghouse Electric Corp. Spectral shift reactor control method. 4,432,930, Cl. 376-215.000.

Industra Products, Inc.: *See*—
Walker, Robert G., 4,432,400, Cl. 140-92.100.

Industrie Pirelli: *See*—
Amesso, Claudio; and Donaggio, Paolo, 4,432,177, Cl. 52-309.170.

Ing. C. Olivetti & C., S.p.A.: *See*—
De Marco, Giuliano; and Gemi, Roberto, 4,433,352, Cl. 360-105.000.

Ing. Fritz Kubler, Zahlerfabrik GmbH: *See*—
Kubler, Fritz, 4,433,234, Cl. 235-132.00E.

Ingham, Paul: *See*—
Greaves, Brian; and Ingham, Paul, 4,432,879, Cl. 210-699.000.

Ingle, Frank W. FM Demodulator including automatic threshold control circuit. 4,433,300, Cl. 329-136.000.

Innes, Charles B., Jr.: *See*—
Wentzell, Timothy H.; and Innes, Charles B., Jr., 4,432,271, Cl. 91-527.000.

Inoue, Akihiro; and Kamiya, Akihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. High pressure discharge lamp. 4,433,271, Cl. 315-63.000.

Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, to Honda Giken Kogyo Kabushiki Kaisha. Supercharger apparatus for internal combustion engine. 4,432,205, Cl. 60-605.000.

Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, to Nippondenso Co., Ltd. Method and system for controlling ignition timing in a multicylinder internal combustion engine. 4,432,322, Cl. 123-416.000.

Inoue, Yoichi; Terayama, Takao; Kasai, Susumu; and Tominaga, Tamotsu, to Hitachi, Ltd. Automatic tape threading device. 4,432,508, Cl. 242-195.000.

Institut de Recherches de la Siderurgie Francaise: *See*—
Zanetta, Hugues; and Richard, Daniel, 4,432,534, Cl. 266-225.000.

Institut Francais du Petrole: *See*—
Weill, Jerome; Garapon, Jacques; and Sillion, Bernard, 4,433,157, Cl. 549-255.000.

Institut Gidrodinamiki Imeni M.A. Lavrentieva: *See*—
Voitsekhovsky, Bogdan V.; and Voitsekhovsky, Mikhail B., 4,432,695, Cl. 416-17.000.

Institut Textile de France: *See*—
Raisin, Jean-Pierre; Helffer, Bernard; and Chirouze, Jean L., 4,432,295, Cl. 112-262.300.

Institute for Industrial Research and Standards: *See*—
Hoary, Marto J., 4,432,351, Cl. 128-17.000.

Intermec Corporation: *See*—
Jue, Clifford T., 4,432,830, Cl. 156-384.000.

International Business Machines Corporation: *See*—
Bacon, James L.; and Smith, Gerald L., 4,432,631, Cl. 355-3.0CH.
Beaven, Paul A., 4,433,392, Cl. 364-900.000.
Bjorklund, Gary C.; and Sincerbox, Glenn T., 4,432,597, Cl. 350-3.700.
Chye, Patrick W.; Hearn, Eric W.; Kulkarni, Murlidhar V.; and Markovits, Gary, 4,432,809, Cl. 148-1.500.
Clark, William D.; Garner, Mark D.; Rhodes, John H., Jr.; and Wilzbach, Bernard L., 4,432,541, Cl. 271-251.000.
Gersbach, John E., 4,433,283, Cl. 323-314.000.
Lewis, Scott C., 4,433,252, Cl. 307-269.000.

Romankiw, Lubomyr T.; and von Gutfeld, Robert J., 4,432,855, Cl. 204-207.000.
Taber, Louis; and East, Don G., 4,433,424, Cl. 375-106.000.
International Standard Electric Corporation: *See—*
Leitl, Franz, 4,432,647, Cl. 356-350.000.
International Telephone and Telegraph Corporation: *See—*
Russo, Vincenzo; and Heesch, Max O., 4,432,583, Cl. 297-330.000.
Sawyer, Edgar W., Jr., 4,432,771, Cl. 44-51.000.
Shelby, Billy L.; and DeCandia, Giovanni, 4,433,367, Cl. 362-370.000.
Intersil: *See—*
Squires, David R., 4,433,282, Cl. 323-281.000.
Intertec Associates Inc.: *See—*
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,432,340, Cl. 126-390.000.
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, to Toyo Kohan Co., Ltd. Process for producing tin-free steel. 4,432,842, Cl. 204-41.000.
Ireco Chemicals: *See—*
Miller, Kenneth A., 4,432,268, Cl. 86-1.00R.
Irie, Toshio: *See—*
Ogata, Hajime; Ichida, Toshio; Tsugawa, Shunichi; and Irie, Toshio, 4,432,845, Cl. 204-56.00R.
Isaacs, Robert B., to Northern Telecom Limited. Faceplate assembly for telecommunications terminals and other terminals. 4,433,216, Cl. 179-178.000.
Ise, Yoji. Vacuum controlling device. 4,432,701, Cl. 417-187.000.
Ishibashi, Satoshi, legal representative: *See—*
Mashita, Masao; Yasuda, Nobuaki; Ishibshi, Tomoyuki, deceased; and Ishibashi, Satoshi, legal representative, 4,433,340, Cl. 346-135.100.
Ishibshi, Tomoyuki, deceased: *See—*
Mashita, Masao; Yasuda, Nobuaki; Ishibshi, Tomoyuki, deceased; and Ishibashi, Satoshi, legal representative, 4,433,340, Cl. 346-135.100.
Ishige, Sadao; Sato, Kozo; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Process for preparing fluoran derivatives. 4,433,156, Cl. 549-227.000.
Ishiguro, Michihiro: *See—*
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.
Ishii, Kinichi, to Kabushiki Kaisha Johnan Seisakusho. Window regulator for an automotive vehicle. 4,432,165, Cl. 49-351.000.
Ishii, Satoshi: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.
Ishii, Yoshiaki; Ando, Naoyoshi; Kume, Tsutomu; and Fujinami, Shosaku, to Agency of Industrial Science and Technology, The. Method of pyrolyzing organic material using a two-bed pyrolysis system. 4,432,290, Cl. 110-346.000.
Ishikawa, Kikuo: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Air-fuel ratio control device of an internal combustion engine. 4,432,324, Cl. 123-438.000.
Ishikawa, Norio; Murayama, Morio; and Nishijima, Yasumoto, to Daido-Maruta Finishing Co., Ltd. Process for the preparation of porous membrane. 4,432,920, Cl. 264-49.000.
Ishikawa, Yuichi: *See—*
Shida, Shigeru; Hosaka, Nobuyoshi; Ishikawa, Yuichi; and Nishida, Osamu, 4,433,093, Cl. 524-433.000.
Ishiwata, Hisao: *See—*
Sano, Tetsu; Yasuzuka, Takezou; Ishiwata, Hisao; and Simizu, Tatsuo, 4,433,230, Cl. 219-118.000.
Ishizaka, Akitoshi: *See—*
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Ishizaka, Fumio: *See—*
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,432,856, Cl. 204-237.000.
Iskiw, Metro. Fish scaler. 4,432,117, Cl. 17-66.000.
Isupov, Rudolf G.: *See—*
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.
Itai, Reiichi: *See—*
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,432,856, Cl. 204-237.000.
Ito, Kazuo, to Toyo Seikan Kaisha, Ltd. Foam liquid dispensing device. 4,432,496, Cl. 239-327.000.
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, to Nippon Oil Co., Ltd. Process for preparing a copolymer aqueous solution from which a catalyst residue is removed. 4,433,098, Cl. 524-811.000.
Itoh, Kazuo: *See—*
Tsuji, Mahito; Kudo, Toshiyuki; and Itoh, Kazuo, 4,433,409, Cl. 369-170.000.
Itoh, Kiyoshi; Nishikawa, Yukiyasu; Hoshika, Shuji; and Okamoto, Ikuzo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Eye refractive error measuring device. 4,432,617, Cl. 351-211.000.
Itoh, Noboru; Takahashi, Toshiaki; Ogi, Keiji; and Kamitakahara, Atsushi, to Konishiroku Photo Industry Co., Ltd. Method for preparing a light-sensitive cuprous halide emulsion. 4,433,049, Cl. 430-495.000.
ITT Industries, Inc.: *See—*
Heinecke, Rudolf A. H.; and Stern, Ronald C., 4,433,012, Cl. 427-252.000.
ITW Limited: *See—*
Palmer, John P.; and Blackburn, Neil P., 4,432,684, Cl. 411-366.000.
Iwakura, Ken: *See—*
Ishige, Sadao; Sato, Kozo; and Iwakura, Ken, 4,433,156, Cl. 549-227.000.
Iwamori, Hidekazu: *See—*
Honzawa, Yatsuhiro; Moriyama, Masuyoshi; and Iwamori, Hidekazu, 4,432,702, Cl. 417-269.000.
Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Ignition system. 4,432,323, Cl. 123-427.000.
Iwata, Toshiharu: *See—*
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, 4,432,322, Cl. 123-416.000.
Iwata, Yasuhiro: *See—*
Saitou, Masao; Iwata, Yasuhiro; and Uchida, Kohachi, 4,432,639, Cl. 355-75.000.
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for refreshing non-volatile memory. 4,433,395, Cl. 365-222.000.
Izaiku, Hiroumi: *See—*
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.
J. I. Case Company: *See—*
Hartman, Wayne E., 4,432,742, Cl. 464-176.000.
Wirsbinski, James L., 4,432,402, Cl. 144-193.00A.
Jackson, Alan D.; and Day, Kenneth E., to Cessna Aircraft Company, The. Reseat relief valve. 4,432,389, Cl. 137-469.000.
Jackson, Ronald W.: *See—*
Rudzki, Eugene M.; Jackson, Ronald W.; and Martocci, Anthony P., 4,432,657, Cl. 374-126.000.
Jacob, Horst: *See—*
Posse, Gunther; and Jacob, Horst, 4,432,747, Cl. 494-8.000.
Jacobs, Hanno: *See—*
Renzel, Peter; and Jacobs, Hanno, 4,432,235, Cl. 73-611.000.
Jacobson, Annette M.: *See—*
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., 4,433,016, Cl. 428-34.000.
Jacobson, Earl B., to Jacobson, Earl B. Reactor head shielding system. 4,432,932, Cl. 376-287.000.
Jacobson, Wayne M.; and Quaintance, Roger L., to Cyclonaire Corporation. Vehicular mobile high capacity pneumatic conveyor. 4,432,676, Cl. 406-39.000.
Jakubik, Adolf: *See—*
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, 4,432,772, Cl. 48-66.000.
James, David R., to James Industries Limited. Equipment for handling invalids and the disabled. 4,432,359, Cl. 128-134.000.
James, Edward A.: *See—*
Schnable, George L.; and James, Edward A., 4,433,008, Cl. 427-85.000.
James Industries Limited: *See—*
James, David R., 4,432,359, Cl. 128-134.000.
James, Malcolm J. F.: *See—*
Harman, Geoffrey E.; and James, Malcolm J. F., 4,432,658, Cl. 374-138.000.
Japan Carlit Co., Ltd., The: *See—*
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,432,856, Cl. 204-237.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, 4,433,109, Cl. 525-314.000.
Jarvineva, Elias A., to Valmet Oy. Liquid fuel tank for an airplane and method and apparatus for manufacturing the same. 4,432,515, Cl. 244-123.000.
Jasinski, Leon, to Motorola, Inc. Acoustical transducer with a slotted piston suspension. 4,433,214, Cl. 179-115.5ES.
Jasys, Vytautas J.: *See—*
Barth, Wayne E.; and Jasys, Vytautas J., 4,432,987, Cl. 424-271.000.
Jayaraman, Viswanath; and Shah, Mahendra R., to Holcroft & Company. Ceramic radiant tube heated aluminum melter and method of melting aluminium. 4,432,791, Cl. 75-65.00R.
Jeenicke, Edmund: *See—*
Schenk, Manfred; Klotzner, Winfried; and Jeenicke, Edmund, 4,433,379, Cl. 364-200.000.
Jenck, Jean, to Rhone-Poulenc Industries. Esters of β,γ-unsaturated carboxylic acids by carbonylation of conjugated dienes. 4,433,164, Cl. 560-207.000.
Jer Manufacturing, Inc.: *See—*
Lawrence, Phillip G.; and Russell, Robert L., 4,432,590, Cl. 312-257.05SK.

Jerome, Norman F.: *See*—
Sikkenga, David L.; Nevitt, Thomas D.; and Jerome, Norman F., 4,433,190, Cl. 585-660.000.

Jester, Theresa L.; Yerkes, John W.; Gay, Charles F.; and Bottenberg, William R., to Atlantic Richfield Company. Roll formed pan solar module. 4,433,200, Cl. 136-251.000.

Joh. Friedrich Behrens AG: *See*—
Kuck, Manfred, 4,432,483, Cl. 227-8.000.

Johansson, Donald, to Broderna Lindqvists Verkstader AB. Steering arrangement at inboard-outboard drive unit. 4,432,737, Cl. 440-60.000.

Johnson, Betty J. Cushioning patellar support device. 4,432,101, Cl. 3-20.000.

Johnson, David A.: *See*—
Worley, Ronald W.; and Johnson, David A., 4,433,135, Cl. 528-282.000.

Johnson Matthey Public Limited Company: *See*—
Pignon, Thomas E., 4,433,064, Cl. 502-527.000.

Johnson, Phillip L. M.; and Walden, John R., to Plessey Overseas Limited. Sonar receivers. 4,433,396, Cl. 367-105.000.

Johnson, Theodore W.: *See*—
Adams, Ronald W.; and Johnson, Theodore W., 4,432,822, Cl. 156-148.000.

Johnsson, Bengt D. Feed stuff administration device for minks. 4,432,304, Cl. 119-18.000.

Joly, Jean: *See*—
Rietsch, Maurice; and Joly, Jean, 4,432,507, Cl. 242-107.40A.

Jones, Addison B.; and Erdmann, Francis M., to Rockwell International Corporation. Process for in-situ formation of niobium-insulator-niobium Josephson tunnel junction devices. 4,432,134, Cl. 29-578.000.

Jones, Alun, to British Steel Corporation. Determination of plastic anisotropy in sheet material. 4,432,234, Cl. 73-597.000.

Jones, William R.; Trivedi, Harish S.; and Gane, Timothy L., to Glaxo Group Limited. Intermediate for use in the preparation of cephalosporin antibiotics. 4,433,141, Cl. 544-25.000.

Joseph, John S.: *See*—
Gradin, James H.; and Joseph, John S., 4,433,344, Cl. 358-181.000.

Joseph, Joseph P.: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,432,991, Cl. 424-273.00P.

Joy Manufacturing Company: *See*—
Novoselac, John; and Churcher, Dale L., 4,432,748, Cl. 494-2.000.

Jue, Clifford T., to Internec Corporation. Label printer having selectable label stock paths. 4,432,830, Cl. 156-384.000.

Julia, Marc: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,433,171, Cl. 568-33.000.

Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,432,923, Cl. 264-206.000.

Juntgen, Harald; Knoblauch, Karl; Reichenberger, Jurgen; and Schroter, Hans-Jurgen, to Bergwerksverband GmbH. Adsorption-desorption process for the recovery of hydrogen. 4,432,774, Cl. 55-25.000.

Jurecki, Ralph J.: *See*—
Schultz, James R.; Smith, Francis E.; and Jurecki, Ralph J., 4,432,169, Cl. 51-424.000.

Jurinak, Edward L., to Apollo Label Company. Printing press. 4,432,282, Cl. 101-350.000.

Jury, Anthony W.: *See*—
Parkinson, Michael J.; Jury, Anthony W.; Syred, Nicholas; and Owen, Ieuan, 4,432,778, Cl. 55-212.000.

K. E. McConnaughay, Inc.: *See*—
Ostermeyer, Larry F.; and Guerin, Michael N., 4,433,084, Cl. 524-62.000.

Kabu, Yasunori; Yasunaka, Masayoshi; Morita, Yoshinori; and Motowoka, Masanori, to Mitsui Petrochemical Industries, Ltd. Polymerization process. 4,433,121, Cl. 526-68.000.

Kabushiki Kaisha Johnan Seisakusho: *See*—
Ishii, Kinichi, 4,432,165, Cl. 49-351.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.

Kabushiki Kaisha Okuma Tekkosho: *See*—
Nashiki, Masayuki; and Hamada, Yoshio, 4,433,261, Cl. 310-156.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kurosaka, Yoshinori, 4,432,616, Cl. 351-106.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Honzawa, Yatsuhiro; Moriyama, Masuyoshi; and Iwamori, Hidekazu, 4,432,702, Cl. 417-269.000.

Kadija, Igor V., to Olin Corporation. Method for producing reticulate electrodes for electrolytic cells. 4,432,838, Cl. 204-11.000.

Kadner, Martin: *See*—
Ebinger, Horst; Kadner, Martin; and Luthardt, Guenther, 4,432,892, Cl. 252-628.000.

Kahn, Leonard R. Method and means for modulating waves. 4,433,312, Cl. 332-22.000.

Kakegawa, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for transmitting energy to a device implanted in a living body. 4,432,363, Cl. 128-419.0PS.

Kakei, Tsutomu: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,432,854, Cl. 204-206.000.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Kali-Chemie AG: *See*—
Musall, Reimar; and Wolsing, Wilhelm, 4,432,943, Cl. 422-179.000.

Kalinsky, Wayne A.: *See*—
Carollo, James A.; and Kalinsky, Wayne A., 4,433,277, Cl. 320-24.000.

Kallfass, Traugott: *See*—
Luder, Ernst; and Kallfass, Traugott, 4,433,319, Cl. 338-34.000.

Kalowski, Thaddeus J.: *See*—
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., 4,433,001, Cl. 426-614.000.

Kamata, Kazumasa; and Tateyama, Masamitsu, to Mitsubishi Rayon Company Ltd. Impact-resistant methacrylic resin composition. 4,433,103, Cl. 525-81.000.

Kamitakahara, Atsushi: *See*—
Itoh, Noboru; Takahashi, Toshiaki; Ogi, Keiji; and Kamitakahara, Atsushi, 4,433,049, Cl. 430-495.000.

Kamiya, Akihiro: *See*—
Inoue, Akihiro; and Kamiya, Akihiro, 4,433,271, Cl. 315-63.000.

Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, to Hitachi, Ltd. Process for treatment of detergent-containing radioactive liquid wastes. 4,432,894, Cl. 252-632.000.

Kammerer, Heinz: *See*—
Hermle, Rolf; Kammerer, Heinz; and Langheinrich, Hans, 4,433,309, Cl. 331-65.000.

Kamyr, Inc.: *See*—
Sherman, Michael I.; and Richter, Johan C. F. C., 4,432,836, Cl. 162-237.000.

Kanai, Takeo: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.

Kaneda, Isami; Sakakibara, Susumu; and Sano, Yasushi, to Victor Company of Japan, Ltd. Reference signal detection circuit in a rotary recording medium reproducing apparatus. 4,433,402, Cl. 369-43.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Senda, Kenichi; Nishida, Tatehiko; and Nakagawa, Masao, 4,433,029, Cl. 428-407.000.
Tawada, Yoshihisa; Yamamoto, Tetsuro; Ushioda, Minoru; and Saito, Kazuo, 4,433,097, Cl. 524-789.000.

Kaneko, Junichi: *See*—
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,432,212, Cl. 62-229.000.

Kaneko, Kenji; Okabe, Takahiro; Nagata, Minoru; and Okada, Yutaka, to Hitachi, Ltd. Complementary Schottky transistor logic circuit. 4,433,258, Cl. 307-456.000.

Kaneko, Mamoru: *See*—
Noguchi, Toyota; Kaneko, Mamoru; and Katoh, Hironori, 4,433,311, Cl. 332-11.00D.

Kaneko, Takushi; Essery, John M.; Schmitz, Henry; and Doyle, Terrence W., to Bristol-Myers Company. 3-Hydroxyiminoscirpen-4β, 15-diol esters useful as antitumor agents. 4,433,158, Cl. 549-332.000.

Kaneko, Teruo: *See*—
Watanabe, Atsuo; Kaneko, Teruo; Tanaka, Takeo; and Saito, Yoshio, 4,432,939, Cl. 422-93.000.

Kanno, Hideyuki, to Tomy Corporation. Toy and associated noise producing mechanism. 4,432,159, Cl. 46-177.000.

Kano, Naoki: *See*—
Shimamura, Tadao; and Kano, Naoki, 4,432,959, Cl. 423-365.000.

Kany, Manfred. Decomposing plant. 4,433,055, Cl. 435-313.000.

Kapellner, Arnold, to Voest-Alpine Aktiengesellschaft. Bearing to be used for a rotating body. 4,432,588, Cl. 308-234.000.

Karadsheh, Sam M.; and Radomski, Thomas A., to General Motors Corporation. Multiple phase chopper current limiting. 4,433,370, Cl. 363-124.000.

Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Phosphonamidate compounds. 4,432,971, Cl. 424-177.000.

Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Phosphonamidate compounds. 4,432,972, Cl. 424-177.000.

Karlsson, Arne V.: *See*—
Westerstrandh, Bjorn V.; and Karlsson, Arne V., 4,432,346, Cl. 126-445.000.

Karpati, Egon: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Karwan, Henry P.: *See*—
Riise, H. Norman; Goranson, George G.; and Karwan, Henry P., 4,432,343, Cl. 126-424.000.

Kasahara, Yasushi: *See*—
Sugiyama, Masami; Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,432,896, Cl. 260-112.50R.

Kasai, Kenjiro: *See*—
Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, 4,432,216, Cl. 62-514.00R.

Kasai, Susumu: *See*—
Inoue, Yoichi; Terayama, Takao; Kasai, Susumu; and Tominaga, Tamotsu, 4,432,508, Cl. 242-195.000.

Kassan, Peter. Puzzle cube. 4,432,548, Cl. 273-153.00S.
Kastening, Bertel: *See*—
Faul, Wolfgang; and Kastening, Bertel, 4,432,872, Cl. 210-205.000.
Katagiri, Shinjiro: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Katahira, Hiroaki; and Kobayashi, Shigeru, to Nissan Motor Company, Limited. Air-conditioning system of motor vehicle. 4,432,213, Cl. 62-239.000.
Katakura, Masayuki; Akagiri, Kenzo; and Ookouchi, Motomi, to Sony Corporation. Level detecting circuit. 4,433,254, Cl. 307-350.000.
Kataoka, Masami; and Higo, Nobumasa, to Nippondenso Co., Ltd. Flow rate transducer. 4,432,244, Cl. 73-861.770.
Katayama Chemical Works Co., Ltd.: *See*—
Kawasaki, Yoshinari; and Hanno, Kenji, 4,432,884, Cl. 252-180.000.
Katayama, Yoshifumi: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Katchman, Arthur: *See*—
Haaf, William R.; Huebner, James A.; and Katchman, Arthur, 4,433,088, Cl. 524-153.000.
Kato, Kentaro: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,432,205, Cl. 60-605.000.
Kato, Yutaka: *See*—
Tanaka, Ryohei; Kitamura, Akinobu; Odake, Takaaki; and Kato, Yutaka, 4,433,325, Cl. 340-937.000.
Katoh, Hironori: *See*—
Noguchi, Toyota; Kaneko, Mamoru; and Katoh, Hironori, 4,433,311, Cl. 332-11.00D.
Katz, Edward R. Stabilizer for the contents of furniture drawers during furniture moving and method. 4,432,401, Cl. 141-4.000.
Kaufhold, Manfred, to Chemische Werke Huels, A.G. Process for the production of pure neohexanol. 4,433,175, Cl. 568-471.000.
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, to Glennco Trust. Process for molding a brake lining friction product. 4,432,922, Cl. 264-119.000.
Kawabata, Tasuke: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.
Kawai, Shizuo: *See*—
Matsuda, Yasushi; and Kawai, Shizuo, 4,432,321, Cl. 123-380.000.
Kawai, Yoshio; and Kitagawa, Kiyoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for measuring interfacial electrokinetic phenomena. 4,433,299, Cl. 324-464.000.
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, to Kabushiki Kaisha Kobe Seiko Sho. Material for steel wool. 4,432,792, Cl. 75-123.00R.
Kawamata, Shyozo: *See*—
Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, 4,433,110, Cl. 525-323.000.
Kawamura, Takahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the idling rotational speed of an internal combustion engine. 4,432,317, Cl. 123-339.000.
Kawanishi, Tsuneaki; Mukoh, Akio; Morishita, Hirosada; and Hoshi, Nobuyoshi, to Hitachi Metals, Ltd. Electrophotographic developing method using magnetic toners. 4,433,042, Cl. 430-126.000.
Kawasaki Steel Corporation: *See*—
Ogata, Hajime; Ichida, Toshio; Tsugawa, Shunichi; and Irie, Toshio, 4,432,845, Cl. 204-56.00R.
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.
Kawasaki, Yoshinari; and Hanno, Kenji, to Katayama Chemical Works Co., Ltd. Scale inhibiting agent. 4,432,884, Cl. 252-180.000.
Kawashima, Ikue; Fukushima, Yoshio; Murano, Tamio; and Suzuki, Toshitatsu, to Ricoh Company, Ltd. Focusing-position-detection circuit. 4,432,622, Cl. 354-408.000.
Kawashima, Kazumi: *See*—
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.
Kay, Ian T.; and Noon, Robert A., to Imperial Chemical Industries PLC. Biologically active heterocyclic compounds. 4,432,784, Cl. 71-88.000.
Kay, Nicholas W., to Burroughs Corporation. Air fireable ink. 4,433,269, Cl. 313-632.000.
Kearney & Trecker Corporation: *See*—
Currer, John T., 4,432,258, Cl. 82-1.200.
Keefer, Bowie G., to Seagold Industries Corporation. Reverse osmosis apparatus and method incorporating external fluid exchange. 4,432,876, Cl. 210-652.000.
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., to Monsanto Company. Inhibition of polyurethane hardening. 4,433,089, Cl. 524-294.000.
Keith, Alec D.; and Hsiao, Charles, to Key Pharmaceuticals, Inc. Quinidine sustained release dosage formulation. 4,432,965, Cl. 424-19.000.
Keith, Earl K., to Dow Chemical Company, The. Method for adding insoluble material to a liquid or partially liquid metal. 4,432,936, Cl. 420-590.000.
Keller, Bruno: *See*—
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,432,174, Cl. 52-222.000.
Kellogg, Michael S., to Pfizer Inc. 6-beta-Halopenicillanic acid 1,1-dioxides as beta-lactamase inhibitors. 4,432,970, Cl. 424-114.000.
Kelly, John F., to Gillette Company, The. Protective razor package. 4,432,452, Cl. 206-354.000.
Kelvin Lenses Limited: *See*—
Tighe, Brian J.; and Gee, Howard J., 4,433,111, Cl. 525-326.200.
Kemanord AB: *See*—
Andersson, Bengt; and Tanner, Olof, 4,432,825, Cl. 156-307.300.
Kemmel, Patrice J., to Pfaff Haushalmaschinen GmbH. Low thread supply monitor in a sewing machine. 4,432,297, Cl. 112-278.000.
Kemppainen, Gunnar. Coupling. 4,432,570, Cl. 285-24.000.
Kendall Company, The: *See*—
Manschot, James G.; Salvadori, Lawrence A.; and Plekenpol, David D., 4,432,763, Cl. 604-262.000.
Kendall, James W.: *See*—
Angelosanto, Donald J.; and Kendall, James W., 4,432,679, Cl. 411-34.000.
Kennedy, Katherine L.; Proctor, Paul W.; and Dow, Robert L., to United States of America, Navy. Pyrotechnic composition for cutting torch. 4,432,816, Cl. 149-19.300.
Kenneth C. Schifftner, Inc.: *See*—
Schifftner, Kenneth C., 4,432,914, Cl. 261-111.000.
Keppler, Hans G., to BASF Aktiengesellschaft. Preparation of styrene suspension polymers. 4,433,108, Cl. 525-255.000.
Kerlin, Jack H., to Balance Dynamics Co. Unbalance compensator. 4,432,253, Cl. 74-573.00R.
Kernforschungsanlage Julich GmbH: *See*—
Faul, Wolfgang; and Kastening, Bertel, 4,432,872, Cl. 210-205.000.
Groeneweg, Joost; and Schluter, Manfred, 4,432,869, Cl. 210-602.000.
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Henrich, Edmund; and Schlich, Elmar, 4,432,955, Cl. 423-249.000.
Holleck, Helmut, 4,432,794, Cl. 75-239.000.
Kerry, John C.: *See*—
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.
Kersten, Hilde; Zengel, Hans G.; and Toth, Anton, to Akzo NV. Waterdispersible cationic resins for electrodeposition. 4,433,078, Cl. 523-404.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Hsiao, Charles, 4,432,965, Cl. 424-19.000.
Khan, Jawed M., to GTE Business Communication Systems Inc. Power supply control apparatus. 4,433,250, Cl. 307-66.000.
Kida, Shuji: *See*—
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,433,046, Cl. 430-385.000.
Kidde, Inc.: *See*—
Provencher, Amede R., 4,433,218, Cl. 200-11.00R.
Kiddie, Inc.: *See*—
Sterner, Russell L., 4,432,691, Cl. 414-735.000.
Kiernan, Jane A.; and Baker, Pamela K., to American Cyanamid Company. 5-[2-(Ethylamino)-1-hydroxylethyl] anthranilonitrile and the use thereof in meat producing animals. 4,432,995, Cl. 424-304.000.
Kikawa, Yoshio: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.
Kikkawa, Seiichi: *See*—
Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, 4,432,216, Cl. 62-514.00R.
Kilham, Peter. Stove construction for achieving complete fuel combustion. 4,432,335, Cl. 126-60.000.
Kilpatrick, Lester L.: *See*—
Lee, Lien-Mow; and Kilpatrick, Lester L., 4,432,893, Cl. 252-631.000.
Kimberly-Clark Corporation: *See*—
Breese, John A., 4,432,833, Cl. 162-158.000.
Moore, William J., 4,432,823, Cl. 156-164.000.
Kimmel, Walter. Roof attached article carrier for vehicles. 4,432,480, Cl. 224-329.000.
Kimura, Kenji, to Olympus Optical Co., Ltd. Bias control apparatus for a recording system. 4,433,349, Cl. 360-66.000.
Kimura, Syozi: *See*—
Ogawa, Hiroshi; Kimura, Syozi; and Miyawaki, Yoshinori, 4,432,373, Cl. 128-680.000.
Kinetic Concepts, Inc.: *See*—
Vrzalik, John H., 4,432,353, Cl. 128-24.00R.
King, Donald W.: *See*—
Norvell, Gordon S.; and King, Donald W., 4,432,660, Cl. 403-29.000.
Kingsley, William: *See*—
Stoffel, James C.; Seachman, Ned J.; Hauber, Jack R.; and Kingsley, William, 4,433,346, Cl. 358-293.000.
Kinoshita, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage supply for operating a plurality of changing transistors in a manner which reduces minority carrier disruption of adjacent memory cells. 4,433,257, Cl. 307-443.000.
Kinsbron, Eliezer; and Lynch, William T., to Bell Telephone Laboratories, Incorporated. Formation of sidewall oxide layers by reactive

oxygen ion etching to define submicron features. 4,432,132, Cl. 29-571.000.

Kintzinger, Warren H.: *See*—
Smith, Dorsey T.; Bieser, Albert H.; and Kintzinger, Warren H., 4,433,337, Cl. 343-765.000.

Kiraly, Arpad: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Kiraly nee Soos, Gyongyver: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Kirisawa, Toyohiko: *See*—
Onuki, Osamu; and Kirisawa, Toyohiko, 4,432,208, Cl. 62-55.500.

Kiriyama, Takashi: *See*—
Andoh, Masamoto; Ohhori, Harumi; and Kiriyama, Takashi, 4,432,586, Cl. 303-115.000.

Kishi, Kenichi: *See*—
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,433,046, Cl. 430-385.000.

Kiss, Gunter H., to Lignotock Verfahrenstechnik GmbH. Apparatus for moulding three-dimensionally shaped moulded articles from binder-containing web-like non-woven fabrics. 4,432,716, Cl. 425-89.000.

Kita, Toru, to Nissan Motor Co., Ltd. Karman vortex type flow measuring apparatus. 4,432,241, Cl. 73-861.220.

Kitagawa, Kiyoshi: *See*—
Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,433,299, Cl. 324-464.000.

Kitagawa, Naoto: *See*—
Suzuki, Ichiro; Nakagawa, Yasushi; and Kitagawa, Naoto, 4,432,565, Cl. 280-779.000.

Kitamura, Akinobu: *See*—
Tanaka, Ryohei; Kitamura, Akinobu; Odake, Takaaki; and Kato, Yutaka, 4,433,325, Cl. 340-937.000.

Kitchen, Robert D., to Honeywell Inc. Actuator mechanism with enhanced tactile characteristics. 4,433,224, Cl. 200-330.000.

Kitsuya, Minoru: *See*—
Nii, Katsutoshi; Okano, Kinpei; Doi, Motomichi; and Kitsuya, Minoru, 4,433,432, Cl. 378-193.000.

Kiuchi, Masayoshi: *See*—
Sakurada, Nobuaki; Kiuchi, Masayoshi; and Thunoda, Masahiro, 4,432,628, Cl. 354-289.120.

Klaschka, Rudolf: *See*—
Wolf, Franz-Josef; and Klaschka, Rudolf, 4,433,361, Cl. 361-433.000.

Klein, Albert M. Integrated drill leveling apparatus. 4,432,146, Cl. 33-334.000.

Klein, Howard J.: *See*—
Harris, Bernard; and Klein, Howard J., 4,433,242, Cl. 250-358.100.

Kleinert, Werner L., to Meyer, Carl R. Swimming pool integral structural wall brace system. 4,432,173, Cl. 52-167.700.

Kline, George A., to Diamond Shamrock Corporation. Method for making metallided foils. 4,432,839, Cl. 204-12.000.

Klockner-Humboldt-Deutz AG: *See*—
Maier, Martin; and Ruprecht, Hermann, 4,432,192, Cl. 56-15.300.
Moser, Gottfried; and Gross, Hansjurgen, 4,432,493, Cl. 237-12.30R.
Posse, Gunther; and Jacob, Horst, 4,432,747, Cl. 494-8.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Matzen, Max, 4,432,704, Cl. 417-294.000.

Klomp, Edward D.; and Stevens, David A., to General Motors Corporation. Engine intake port with variable swirl vanes. 4,432,312, Cl. 123-188.0VA.

Klose, Reinhard; and Glienke, Gunter, to Stahlwerke Peine-Salzgitter AG. Method and device for analyzing the solid matter content in a hydraulic conveying stream of a carrier liquid with solid particles. 4,432,674, Cl. 406-19.000.

Klotzner, Winfried: *See*—
Schenk, Manfred; Klotzner, Winfried; and Jeenicke, Edmund, 4,433,379, Cl. 364-200.000.

KMS Fusion, Inc.: *See*—
Teitel, Robert J.; and Solomon, David E., 4,432,933, Cl. 376-152.000.

Kneller, William A.; and Nicholson, John P., to N-Viro Energy Systems Ltd. Beneficiating kiln dusts utilized in pozzolanic reactions. 4,432,800, Cl. 106-85.000.

Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,433,176, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., 4,433,177, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., 4,433,178, Cl. 568-487.000.

Knoblauch, Karl: *See*—
Justgen, Harald; Knoblauch, Karl; Reichenberger, Jurgen; and Schroter, Hans-Jurgen, 4,432,774, Cl. 55-25.000.

Knorr, Harald; Handte, Reinhard; Willms, Lothar; and Tammer, Thomas, to Hoechst Aktiengesellschaft. Process for the manufacture of 2,6-dichlorobenzoxazole and 2,6-dichlorobenzthiazole. 4,433,153, Cl. 548-152.000.

Knorr, Raymond S.; Chandler, Joe D.; and Tran, Loi N., to Monsanto Company. Stopping/restarting free radical polymerizations. 4,433,122, Cl. 526-83.000.

Knox, Jack R.: *See*—
Schwartz, Michael M.; Knox, Jack R.; and Paschke, Edward E., 4,433,118, Cl. 525-437.000.

Koala Technologies Corporation: *See*—
Griffith, William M., 4,433,217, Cl. 200-5.00R.

Koarai, Jiro: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.

Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device of controlling the idling speed of an engine. 4,432,318, Cl. 123-339.000.

Kobashi, Rikizo: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.

Kobayashi, Hiroshi; Yamada, Hisashi; and Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Liquid crystal display device. 4,432,610, Cl. 350-331.00R.

Kobayashi, Morimasa: *See*—
Sarurai, Nobuo; and Kobayashi, Morimasa, 4,432,260, Cl. 83-13.000.

Kobayashi, Noriyuki; and Funamoto, Akihiko, to Nippon Soda Company Limited. Water-dispersion adhesive for extrusion lamination. 4,433,079, Cl. 523-404.000.

Kobayashi, Shigeru: *See*—
Katahira, Hiroaki; and Kobayashi, Shigeru, 4,432,213, Cl. 62-239.000.

Koch, Frank, to DeFelsko Corporation. Magnetic coating thickness comparator having parallel magnetic rods with nonmagnetic slide indicators. 4,433,290, Cl. 324-230.000.

Kodaira, Yasuo, to Nihon Kaiheiki Industrial Company, Ltd. Miniaturized push button switch. 4,433,222, Cl. 200-153.00J.

Kodera, Masao; and Akita, Shigeyuki, to Nippon Soken, Inc. Ultrasonic transducer. 4,433,398, Cl. 367-140.000.

Koelmel, Donald F.: *See*—
Shalaby, Shalaby W.; Schipper, Edgar S.; and Koelmel, Donald F., 4,433,161, Cl. 560-66.000.

Kogan, Boris I.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Kohler, Gisbert; Weiss, Hermann; and Landwehr, Gotz, to Andreas Stihl. Safety device on a power saw. 4,432,139, Cl. 30-381.000.

Koike, Hidemi: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.

Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, to Hitachi, Ltd. Apparatus for atomizing a sample including a slidable pressure maintaining arrangement. 4,432,643, Cl. 356-312.000.

Koizumi, Mitsuyoshi: *See*—
Akiyama, Nobuyuki; Ohshima, Yoshimasa; and Koizumi, Mitsuyoshi, 4,433,235, Cl. 250-201.000.

Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. PCM Signal processor. 4,433,415, Cl. 371-37.000.

Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. PCM Signal processor. 4,433,416, Cl. 371-37.000.

Kojima, Toshitake: *See*—
Ogawa, Masanobu; and Kojima, Toshitake, 4,433,167, Cl. 562-534.000.

Kokka Kogyo Kabushiki Kaisha: *See*—
Kurokawa, Masahito, 4,432,441, Cl. 188-267.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Niiro, Yasuhiko; and Ejiri, Yoshihiro, 4,432,605, Cl. 350-96.230.

Kolibas, James A., to Nordson Corporation. Electrostatic system analyzer. 4,433,296, Cl. 324-452.000.

Kollaritsch, Paul W., to Bell Telephone Laboratories, Incorporated. Programmable logic array interconnection matrix. 4,433,331, Cl. 340-825.830.

Konagaya, Tsuyoshi: *See*—
Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, 4,433,229, Cl. 219-84.000.

Kondo, Kaname: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.

Kondo, Toshiro; and Hamaoka, Kiyohiko, to Toyo Kogyo Co., Ltd. Mounting mechanism for a differential gear assembly of an automobile. 4,432,428, Cl. 180-73.00D.

Kondo, Yoshikazu: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, 4,432,842, Cl. 204-41.000.

Kone Oy: *See*—
Heikkinen, Urho, 4,432,403, Cl. 144-342.000.

Konig, Klaus: *See*—
Pedain, Josef; Wellner, Wolfgang; Konig, Klaus; and Gruber, Hermann, 4,433,010, Cl. 427-160.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Takao; and Hohnishi, Satoru, 4,433,050, Cl. 430-542.000.
Akanabe, Yuichi; Ikeda, Hiroaki; Maeda, Masatoshi; and Funaki, Shinsuke, 4,432,598, Cl. 350-6.700.
Itoh, Noboru; Takahashi, Toshiaki; Ogi, Keiji; and Kamitakahara, Atsushi, 4,433,049, Cl. 430-495.000.
Nosaka, Isao; Sakaguchi, Hirofumi; Shiozawa, Takao; and Fujii, Yozo, 4,432,633, Cl. 355-8.000.

Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,433,046, Cl. 430-385.000.

Konter, Wolfgang: *See*—
Musch, Rudiger; Konter, Wolfgang; and Gobel, Wilhelm, 4,433,106, Cl. 525-215.000.

Koppel, Paul E.; Williams, Joseph J.; and Woebcke, Herman N., to Stone & Webster Engineering Corp. Process for the production of ethane. 4,433,193, Cl. 585-752.000.

Koppers Company, Inc.: *See*—
Holter, Samuel N., 4,433,181, Cl. 568-750.000.

Korpman, Ralf, to Permacel. Radiation cured, high temperature pressure-sensitive adhesive. 4,432,848, Cl. 204-159.170.

Korsak, Andrew J., to All-Lock Electronics, Inc. Key code. 4,432,142, Cl. 33-174.00F.

Kottke, Lawrence F.: *See*—
Anderson, David S.; and Kottke, Lawrence F., 4,432,707, Cl. 417-477.000.

Koutavas, Samuel G.: *See*—
Howe, Gary L.; and Koutavas, Samuel G., 4,432,341, Cl. 126-417.000.

Kovach, Stephen M.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Myers, George D., deceased; Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., 4,432,863, Cl. 208-113.000.

Kowalchuk, Paul G. Duplicating fence for attachment to a rip saw fence of a table saw. 4,432,263, Cl. 83-438.000.

Kozlik, Antonin: *See*—
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.

Krause, Gerhard, to Krause, Gerhard. Optical apparatus for measuring transmission or absorption along a measurement path. 4,432,649, Cl. 356-438.000.

Krautkramer-Branson, Inc.: *See*—
Renzel, Peter; and Jacobs, Hanno, 4,432,235, Cl. 73-611.000.

Kretchman, Gerald L.; and Mason, Anthony, to Whirlpool Corporation. Easy service motor mount for an automatic washer. 4,432,528, Cl. 248-603.000.

Kreutz, Hermann: *See*—
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.

Kristensen, Steen: *See*—
Madsen, Rud F.; Nielsen, Werner K.; and Kristensen, Steen, 4,432,806, Cl. 127-48.000.

Kubler, Fritz, to Ing. Fritz Kubler, Zahlerfabrik GmbH. Mechanical preselection counter. 4,433,234, Cl. 235-132.00E.

Kubo, Yoshimi; Shimizu, Shigeaki; Suzuki, Tetsuo; and Igarashi, Hitoshi, to Nippon Electric Co., Ltd. Method of producing porous body for solid electrolytic capacitor. 4,432,935, Cl. 419-2.000.

Kubota, Hidenobu: *See*—
Iizuka, Masahiko; Kubota, Hidenobu; and Sano, Emiko, 4,433,052, Cl. 435-68.000.

Kubota Ltd.: *See*—
Nakamura, Shiro; Nakagawa, Yoshihiro; and Hashimoto, Takashi, 4,433,032, Cl. 428-682.000.
Tamura, Hideo; and Ibuki, Seiro, 4,432,804, Cl. 106-306.000.

Kubota, Yosinori, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Torch for cutting, welding or heating. 4,433,358, Cl. 361-260.000.

Kuch, Philip L.: *See*—
Herrington, Daniel R.; and Kuch, Philip L., 4,432,960, Cl. 423-539.000.

Kuck, Manfred, to Joh. Friedrich Behrens AG. Safety release mechanism for fastening devices. 4,432,483, Cl. 227-8.000.

Kudo, Toshiyuki: *See*—
Tsuji, Mahito; Kudo, Toshiyuki; and Itoh, Kazuo, 4,433,409, Cl. 369-170.000.

Kudo, Yozo: *See*—
Sawa, Yuji; and Kudo, Yozo, 4,432,457, Cl. 209-557.000.

Kulkarni, Murlidhar V.: *See*—
Chye, Patrick W.; Hearn, Eric W.; Kulkarni, Murlidhar V.; and Markovits, Gary, 4,432,809, Cl. 148-1.500.

Kulprathipanja, Santi, to UOP Inc. Separation of trans- and cis-olefins. 4,433,195, Cl. 585-820.000.

Kumada, Akira: *See*—
Murata, Michihiro; and Kumada, Akira, 4,433,320, Cl. 338-35.000.

Kume, Tsutomu: *See*—
Ishii, Yoshiaki; Ando, Naoyoshi; Kume, Tsutomu; and Fujinami, Shosaku, 4,432,290, Cl. 110-346.000.

Kunishige, Fumio: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, 4,432,842, Cl. 204-41.000.

Kunkel, Hans-Achim: *See*—
Lohmar, Ernst; and Kunkel, Hans-Achim, 4,432,580, Cl. 296-39.00A.

Kunz, Bernard L., to Emerson Electric Co. Thermostatic expansion valve with remote adjustment. 4,432,492, Cl. 236-92.00B.

Kupper, Friedrich-Wilhelm; Padberg, Gunter; Reichert, Ulrich; and Trautmann, Walter, to Chemische Werke Huls AG. Production of impact-resistant styrene polymers. 4,433,099, Cl. 525-53.000.

Kurahashi, Takeo: *See*—
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Kuraray Co., Ltd.: *See*—
Narukawa, Hiroshi; Tada, Rentaro; Takeuchi, Yasuhira; and Ohara, Osamu, 4,433,020, Cl. 428-113.000.
Takayanagi, Motowo; and Murata, Yoshihumi, 4,433,117, Cl. 525-425.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,433,299, Cl. 324-464.000.
Sawa, Yuji; and Kudo, Yozo, 4,432,457, Cl. 209-557.000.

Kurherr, Waldemar H. Electromagnetic projectile accelerator. 4,432,333, Cl. 124-3.000.

Kuroda, Hitoshi: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, 4,432,842, Cl. 204-41.000.

Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, to Hitachi, Ltd. Blower. 4,432,694, Cl. 415-170.00A.

Kurokawa, Akio: *See*—
Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, 4,433,133, Cl. 528-232.000.

Kurokawa, Hiroshi, to Ricoh Co., Ltd. Lens motor drive device in automatic focusing camera. 4,432,620, Cl. 354-402.000.

Kurokawa, Masahito, to Kokka Kogyo Kabushiki Kaisha. Vibration isolation apparatus. 4,432,441, Cl. 188-267.000.

Kurosaka, Yoshinori, to Kabushiki Kaisha Suwa Seikosha. Frame for a pair of spectacles. 4,432,616, Cl. 351-106.000.

Kurosawa, Nobuyuki; and Suda, Kazuaki, to Sony Corporation. Stereo/monaural selecting circuit. 4,433,209, Cl. 381-1.000.

Kurotaki, Kiyomitu. Roaster. 4,432,274, Cl. 99-400.000.

Kurth, Richard R., to Sperry Corporation. Frequency measuring system for alternating frequency signals. 4,433,422, Cl. 375-10.000.

Kuryla, Alan T.; Penird, Carl W.; and Puhak, Peter G., to North American Philips Consumer Electronics Corp. CRT internal contactor positioning means. 4,433,267, Cl. 313-402.000.

Kuschmierz, Heinz; and Vogel, Wilhelm, to Robert Bosch GmbH. Fuel injection arrangement. 4,432,228, Cl. 73-119.00A.

Kusebauch, Walter: *See*—
Emshoff, Horst W.; and Kusebauch, Walter, 4,432,878, Cl. 210-662.000.

Kusters, Eduard: *See*—
Hartmann, Werner, 4,432,277, Cl. 100-37.000.

Kuwayama, Kenta; Nakagawa, Junzo; Tomii, Keishi; and Hagimori, Kenji, to Toho Aen Kabushiki Kaisha. Zinc alloy for use with electrode. 4,432,937, Cl. 420-513.000.

Kuykendall, Charles R.; and Castle, Richard B., to Minnesota Mining & Manufacturing Company. Breakaway timber support poles. 4,432,172, Cl. 52-98.000.

Kvitkovsky, Konstantin A.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Kyster, Erik; and Thomsen, Svend E., to Danfoss A/S. Hydrostatic control device particularly a steering device. 4,432,270, Cl. 91-436.000.

L. R. Nelson Corporation: *See*—
Bruninga, Kenneth J., 4,432,495, Cl. 239-205.000.

Labitt, Bernard H.: *See*—
Manoogian, David V.; Labitt, Bernard H.; and Wood, Joseph R., 4,433,333, Cl. 343-18.00E.

LaCerte, Richard F.: *See*—
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.

Laganis, Deno; and Yodis, John, to Schenectady Chemicals, Inc. Water-borne hermetic varnish. 4,433,080, Cl. 523-414.000.

L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Kubota, Yosinori, 4,433,358, Cl. 361-260.000.

Lalin, Hill S., to Gilian Instrument Corporation. Fluid sampling. 4,432,248, Cl. 73-863.030.

Lam, Dominic M.: *See*—
Emery, Jared M.; and Lam, Dominic M., 4,432,751, Cl. 604-49.000.

Lam, Tony Y. K.: *See*—
Gullo, Vincent P.; Lam, Tony Y. K.; and Monaghan, Richard L., 4,432,996, Cl. 424-311.000.

Lamm, George L., to G & L Manufacturing & Develop. Corp. Sprayer attachment for a floor buffing machine. 4,432,472, Cl. 222-174.000.

Landry, James E.; and Babb, Richard B. Secondary cooling system for gas compressors. 4,432,209, Cl. 62-62.000.

Landwehr, Gotz: *See*—
Kohler, Gisbert; Weiss, Hermann; and Landwehr, Gotz, 4,432,139, Cl. 30-381.000.

Lang, Gusztav: *See*—
Eble, Monika; and Lang, Gusztav, 4,432,469, Cl. 222-134.000.

Lange, Gerhard; and Boy, Jurgen, to Siemens Aktiengesellschaft. Gas-discharge surge arrester. 4,433,354, Cl. 361-120.000.

Langen, Christianes P.: *See*—
Langen, Johannes C.; and Langen, Christianes P., 4,432,650, Cl. 366-147.000.

Langen, Johannes C.; and Langen, Christianes P. Handling device for handling meat portions. 4,432,650, Cl. 366-147.000.

Langheinrich, Hans: *See*—
Hermle, Rolf; Kammerer, Heinz; and Langheinrich, Hans, 4,433,309, Cl. 331-65.000.
Langley, Kenneth R., to Rolls Royce Limited. Centrifugal seal with deformable frustoconical sealing ring. 4,432,555, Cl. 277-25.000.
Langley, Neal R.: *See*—
Bokerman, Gary N.; and Langley, Neal R., 4,433,096, Cl. 524-783.000.
Lapham, James M.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,432,406, Cl. 160-199.000.
Larco Products, Inc.: *See*—
Miller, Earl, 4,432,155, Cl. 43-22.000.
Largman, Theodore; and Aharoni, Shaul M., to Allied Corporation. Process for increasing the relative viscosity of polycaprolactam with phosphite compound. 4,433,116, Cl. 525-420.000.
Larson, Douglas A.; Tacke, Kenneth L.; White, Craig A.; and Paxton, Ronald E., to Rockcor, Inc. Tracking nozzle for viscous fluid application. 4,433,011, Cl. 427-231.000.
Larson, Willis A.; and Van Zeeland, Anthony J., to Oak Industries Inc. Pressure-sensitive adhesive and application thereof. 4,433,223, Cl. 200-159.00B.
Lasak, John L.; and Tuzzalino, Costenzio A., to Western Electric Company, Inc. Cable pulling eye. 4,432,663, Cl. 403-275.000.
Laskowski, Stanley C.: *See*—
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,432,981, Cl. 424-251.000.
Lasley, Robert A. Hyperbaric oxygen chamber with fluidic control. 4,432,354, Cl. 128-30.000.
Latoka Engineering, Inc.: *See*—
Honerkamp, Joseph D.; and Ebeling, Harold O., 4,432,779, Cl. 55-233.000.
Laurent, Henry: *See*—
Annes, Klaus; Laurent, Henry; and Hofmeister, Helmut, 4,432,976, Cl. 424-241.000.
Laurin, Dean G.: *See*—
Bellotti, Marc; Laurin, Dean G.; Stauber, Ronald C.; and Taylor, Larry C., 4,432,766, Cl. 604-283.000.
Laurito, James J., to Neville Chemical Company. Production of novel resins and their uses in printing ink compositions. 4,433,100, Cl. 525-54.420.
Lawrence, Phillip G.; and Russell, Robert L., to Jer Manufacturing, Inc. Structural system for supporting furniture, shelf and wall panels. 4,432,590, Cl. 312-257.0SK.
Lawson, John E., to Armco Inc. Combination connector and flex joint for underwater tension elements. 4,432,670, Cl. 405-224.000.
Lazzery, Angelo G.: *See*—
Siryj, Bohdan W.; and Lazzery, Angelo G., 4,433,410, Cl. 369-291.000.
Lear Siegler, Inc.: *See*—
Gabriele, Leonard A., 4,432,130, Cl. 29-563.000.
LeBouef, Ralph J., Jr.: *See*—
Gettleman, Lawrence; Farris, Charles L.; Rawls, H. Ralph; and LeBouef, Ralph J., Jr., 4,432,730, Cl. 433-168.000.
Leckrone, Michael E.; and Martucci, James P., to Cordis Corporation. Atrial-based, atrial-ventricular sequential cardiac pacer. 4,432,362, Cl. 128-419.0PG.
Lee, Conrad E.; and Caflinch, Jerry A., to Pako Corporation. Automatic wash tank drain/fill apparatus for processor of photosensitive material. 4,432,475, Cl. 222-509.000.
Lee, Lien-Mow; and Kilpatrick, Lester L., to United States of America, Energy. Precipitation-adsorption process for the decontamination of nuclear waste supernates. 4,432,893, Cl. 252-631.000.
Lee, Shy-Fuh, to Zoecon Corporation. Esters of ureido-phenyl (or pyridyl) phosphinic acids. 4,433,149, Cl. 546-21.000.
Le Fur, Gerard R.: *See*—
Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., 4,433,150, Cl. 546-168.000.
Leger, Geary L., to Western Digital. Chip topography for MOS packet network interface circuit. 4,433,378, Cl. 364-200.000.
Legris, Andre, to Legris S/A. Devices for regulating the flow and the pressure of gaseous fluids. 4,432,385, Cl. 137-271.000.
Legris S/A: *See*—
Legris, Andre, 4,432,385, Cl. 137-271.000.
Lehky, Pavel, to Lonza Ltd. Process for the production of 3,3-dimethylglutaric acid or its esters. 4,433,163, Cl. 560-204.000.
Lehmann, Klaus: *See*—
Bauer, Kurt H.; Osterwald, Hermann; Lehmann, Klaus; and Dreher, Dieter, 4,433,076, Cl. 523-342.000.
Lehner, Gerhard: *See*—
Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, 4,432,320, Cl. 123-357.000.
Leible, Walter T.: *See*—
Snyder, Thomas A.; and Leible, Walter T., 4,432,749, Cl. 604-2.000.
Leist, Helmut, to 501 Hellige GmbH. Physiological sensing unit. 4,432,365, Cl. 128-635.000.
Leitl, Franz, to International Standard Electric Corporation. Device for measuring rotation rates. 4,432,647, Cl. 356-350.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Hughes, E. Barrie; Rubenstein, Edward; and Hofstadter, Robert, 4,432,370, Cl. 128-654.000.
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, to Richter Gedeon Vegyeszeti Gyar Rt. Beta-lactam compounds containing a C-acetal group and process for their preparation. 4,432,901, Cl. 260-239.00A.
Leningradskoe Nauchno-Proizvodstvennoe Obiedinenie Zemleroinogo Mashinostroenia: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.
Lerner, Harold: *See*—
Musto, Dominick J.; and Lerner, Harold, 4,432,648, Cl. 356-387.000.
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., to Sterling Drug Inc. 2-(Pyridinyl or hydroxyphenyl)-8-substituted pyrido[2,3-d]pyrimidin-5(8H)-ones. 4,432,981, Cl. 424-251.000.
Leuthold, Oskar, to Ebauches, Electroniques, S.A. Converter for converting an a.c. voltage into a direct current and an oscillator circuit using said converter. 4,433,371, Cl. 363-127.000.
Levey, George; and Smith, Peter J. Liquid sampling. 4,432,249, Cl. 73-863.830.
Levine, Michael A. Extrinsic infrared detector with dopant site charge-neutralization. 4,433,343, Cl. 357-30.000.
Levot, Ronald G.: *See*—
Garnett, John L.; Long, Mervyn A.; and Levot, Ronald G., 4,432,889, Cl. 502-5.000.
Levy, Alvin C., to Bell Telephone Laboratories, Incorporated. Hot melt coated optical fiber. 4,432,607, Cl. 350-96.340.
Lewis, Delmar D. Cutter for cylindrical locks. 4,432,677, Cl. 408-203.500.
Lewis, John, to Bendix Corporation, The. EMI Shielded connector assembly. 4,433,206, Cl. 174-356.000.
Lewis, Scott C., to International Business Machines Corporation. Input signal responsive pulse generating and biasing circuit for integrated circuits. 4,433,252, Cl. 307-269.000.
Lexel Corporation: *See*—
Woste, Ludger, 4,432,497, Cl. 239-589.000.
Li, Ernest L.: *See*—
Mumford, George V.; and Li, Ernest L., 4,432,461, Cl. 215-252.000.
Liau, Shung-Chung; Cheng, Wei-Min; and Young, Uen-Long, to Formosa Plastics Corporation. Prevention of polymer buildup in polymerization reactors using thin organic coatings by electrolysis of phenol. 4,432,840, Cl. 204-14.00N.
Libby, Alfred F., to ICN Pharmaceuticals, Inc. Process for introducing vitamin B-12 into the bloodstream. 4,432,975, Cl. 424-201.000.
Liebel, Henry L., to Angleboard Inc. Load retainer. 4,432,678, Cl. 410-151.000.
Lietaert, Franz: *See*—
Hilaire, Pierre; Lietaert, Franz; Staroz, Claude; and Schumacher, Walter, 4,432,793, Cl. 75-130.00R.
Lignotock Verfahrenstechnik GmbH: *See*—
Kiss, Gunter H., 4,432,716, Cl. 425-89.000.
Lillegard, Thomas R.: *See*—
Napp, E. Thomas; Stauber, R. C.; and Lillegard, Thomas R., 4,432,231, Cl. 73-290.00V.
Lilly, Eugene B.: *See*—
Muller, Max; Lilly, Eugene B.; and Bott, Richard E., 4,432,112, Cl. 15-36.000.
Lin, Chia-Cheng: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., 4,433,016, Cl. 428-34.000.
Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Process for preparing acetaldehyde from methanol and synthesis gas using a novel catalyst composition. 4,433,176, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Process for preparing acetaldehyde from methanol and synthesis gas using a novel catalyst composition. 4,433,177, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., to Texaco, Inc. Process for preparing acetaldehyde from methanol and synthesis gas using a novel catalyst composition. 4,433,178, Cl. 568-487.000.
Lind, Lars; Melin, Kent; and Sandberg, Lars, to AB Volvo. Wheel spinning control system for motor vehicles. 4,432,430, Cl. 180-197.000.
Linde Aktiengesellschaft: *See*—
Abels, Theodor; and Honecker, Guter, 4,432,424, Cl. 180-6.480.
Lindert, Andreas, to Parker Chemical Company. Treatment of metal with derivative of poly-4-vinylphenol. 4,433,015, Cl. 427-388.400.
Lindgren, Timothy F., to General Motors Corporation. Internal combustion engine ignition system. 4,433,280, Cl. 322-89.000.
Lindow, Steven E., to University of California, The Regents of the. Microrganism inhibition of frost damage to plants. 4,432,160, Cl. 47-2.000.
Lindroos, Sven-Eric E.: *See*—
Waris, Tapio; and Lindroos, Sven-Eric E., 4,432,835, Cl. 162-212.000.
Linhart, Karl; Gleinig, Harald; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Preparing concentrated azo dye solutions using nitrite salt as both coupling component and diazotizing agent. 4,432,899, Cl. 260-157.000.
Linser, Charles M.: *See*—
Cunningham, Carole S.; Linser, Charles M.; Resnick, Brian J.; and Tarvin, Ronald L., 4,433,382, Cl. 364-474.000.
Lion Corporation: *See*—
Umehara, Kenji; Takeda, Hiroshi; and Tomidokoro, Susumu, 4,432,924, Cl. 264-210.800.
Litschke, Peer-Ingo: *See*—
Frey, Rudolf; and Litschke, Peer-Ingo, 4,432,666, Cl. 405-129.000.

Littelfuse, Inc.: *See*—
Daggett, Charles W., 4,432,594, Cl. 339-258.00F.
Litton Systems, Inc.: *See*—
Norvell, Gordon S.; and King, Donald W., 4,432,660, Cl. 403-29.000.
Lobdell, Donn D.; and Goyne, Thomas E., to Cobe Laboratories, Inc. Tubing injection site guard. 4,432,767, Cl. 604-86.000.
Lockett, John L., to Electric Power Research Institute, Inc. Inspection system. 4,432,931, Cl. 376-248.000.
Loczenski, Martin: *See*—
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, 4,432,199, Cl. 57-294.000.
Loersch, Joseph F.; and Neal, James W., to United Technologies Corporation. Shot peening apparatus. 4,432,220, Cl. 72-53.000.
Loesche GmbH: *See*—
Brundiek, Horst; and Werner, Ludwig, 4,432,500, Cl. 241-57.000.
Logan, James D., to Morrison-Knudsen Forest Products Company, Inc. Method and apparatus for the electrostatic orientation of particulate materials. 4,432,916, Cl. 264-24.000.
LogE/Dunn Instruments, Inc.: *See*—
Haddick, David H.; Lyon, George E.; and Menzimer, David A., 4,433,345, Cl. 358-244.000.
Loh, William, to Chevron Research Company. Thienylmethoxyiminoalkyl cyclohexanedione herbicides. 4,432,786, Cl. 71-90.000.
Lohmar, Ernst; and Kunkel, Hans-Achim, to Carl Freudenberg, Firma. Interior lining for motor vehicles. 4,432,580, Cl. 296-39.00A.
Lohse, Friedrich; and Monnier, Charles E., to Ciba-Geigy Corporation. Process for the preparation of di- and poly-allyl ethers. 4,433,179, Cl. 568-664.000.
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., to Honeywell Information Systems Inc. Intersystem translation logic system. 4,433,376, Cl. 364-200.000.
Lommerzheim, Werner: *See*—
Hackler, Erich; Flockenhaus, Claus; and Lommerzheim, Werner, 4,433,066, Cl. 518-706.000.
Long, John V.; and Gagliani, John. Process for producing bonded macroballoon structures and resulting product. 4,433,068, Cl. 521-54.000.
Long, Mervyn A.: *See*—
Garnett, John L.; Long, Mervyn A.; and Levot, Ronald G., 4,432,889, Cl. 502-5.000.
Long, Walter E., to Monsanto Company. Energy conservation system. 4,433,249, Cl. 307-31.000.
Longhouse, Richard E.; Cornwell, William D., Jr.; and Buchanan, Harry C., Jr., to General Motors Corporation. Commutator having segments with a varied dimension. 4,433,263, Cl. 310-233.000.
Lonza Ltd.: *See*—
Lehky, Pavel, 4,433,163, Cl. 560-204.000.
Loomba, Yogendra S.: *See*—
Schwark, O. Jay; and Loomba, Yogendra S., 4,432,119, Cl. 24-603.000.
Lopez, Georges, to Societe de Materials Annexed de Dialyse S.M.A.D. Antiseptic end cap for catheter. 4,432,764, Cl. 604-283.000.
L'Oreal: *See*—
Bugaut, Andree; and Andrillon, Patrick, 4,432,769, Cl. 8-414.000.
Louis, Gerd: *See*—
Schaefer, Nikolaus; Dellmann, Winfried; and Louis, Gerd, 4,432,958, Cl. 423-356.000.
Loutfy, Rafik O.: *See*—
Badesha, Santokh S.; Smith, Thomas W.; and Loutfy, Rafik O., 4,432,841, Cl. 204-14.00N.
Louthan, Rector P., to Phillips Petroleum Company. Preparation of alkyl mercaptoalkanoates from unsaturated carboxylates and CO_2-contaminated H_2S. 4,433,134, Cl. 528-279.000.
Lowell, Francis C.; and Campbell, Thomas K., to Ocean Research Equipment, Inc. Flow calculator with velocity curve fitting circuit means. 4,432,243, Cl. 73-861.310.
Lowndes, Michael W.; Adams, Derek S.; and Arlidge, Neville J., to Lucas Industries Limited. Battery state of charge evaluator system. 4,433,278, Cl. 320-48.000.
Lucas Industries Limited: *See*—
Lowndes, Michael W.; Adams, Derek S.; and Arlidge, Neville J., 4,433,278, Cl. 320-48.000.
Lucas, Jean; and Sylla, Lancine, to Centre National d'Etudes et d'Experimentation de Machinisme Agricole. Inflatable solar collector. 4,432,342, Cl. 126-418.000.
Lucke Apparate-Bau GmbH: *See*—
Arendt, Gerhard; Benz, Roland; Engenhart, Reinhold; and Schmidt, Viktor, 4,432,501, Cl. 242-47.000.
Luder, Ernst; and Kallfass, Traugott, to Endress u. Hauser GmbH u. Co. Moisture sensor and method of manufacturing the same. 4,433,319, Cl. 338-34.000.
Lui, Yiu-Kwan: *See*—
Eleazar, Antonio E.; Heck, Ronald M.; Dettling, Joseph C.; and Lui, Yiu-Kwan, 4,433,191, Cl. 585-671.000.
Lukes, Henry J., to Sundstrand Data Control, Inc. Equalization preamplifier with high frequency gain peaking. 4,433,301, Cl. 330-109.000.
Lundin, Lars. Collecting rope. 4,432,874, Cl. 210-242.400.
Luthardt, Guenther: *See*—
Ebinger, Horst; Kadner, Martin; and Luthardt, Guenther, 4,432,892, Cl. 252-628.000.
Luz, Rudolf, to Maschinenfabrik Schweiter AG. Method and apparatus for splicing thread ends. 4,432,194, Cl. 57-22.000.
Lynch, William T.: *See*—
Kinsbron, Eliezer; and Lynch, William T., 4,432,132, Cl. 29-571.000.
Lyon, George E.: *See*—
Haddick, David H.; Lyon, George E.; and Menzimer, David A., 4,433,345, Cl. 358-244.000.
Lyons, William C.; and White, Albert O. Apparatus for extended straight line drilling from a curved borehole. 4,432,423, Cl. 175-75.000.
Lyss, Esther B. Pill dispenser with sequential dispensing and indicating cap. 4,432,300, Cl. 116-308.000.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Rank, Werner, 4,432,668, Cl. 405-202.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,432,539, Cl. 271-3.100.
M.I.T. Poly-Cart Corp.: *See*—
Rinkewich, Isaac, 4,432,591, Cl. 312-297.000.
M.J.H. Converters, Inc.: *See*—
Groelinger, Howard, 4,433,028, Cl. 428-378.000.
M & R Seal Press Co., Inc.: *See*—
Wall, Alexander C.; and Sculler, Leonard H., 4,432,281, Cl. 101-334.000.
MacDonald, Leslie R.; and Verschoor, Wouter. Wine storage container. 4,432,463, Cl. 217-12.00R.
MacEwen, George E., to Sealright Co., Inc. Cartridge-type dispenser. 4,432,473, Cl. 222-327.000.
Machnee, Cecil B., to Morris Rod-Weeder Co. Ltd. Pneumatic feed control for pneumatic seeder and the like. 4,432,675, Cl. 406-30.000.
Machner, Peter: *See*—
Stiebellehner, Johann; and Machner, Peter, 4,432,811, Cl. 148-2.000.
Mack, Mark P., to Conoco Inc. Polymerization process for drag reducing substances. 4,433,123, Cl. 526-139.000.
Madgavkar, Ajay M.: *See*—
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,433,197, Cl. 585-823.000.
Madsen, Rud F.; Nielsen, Werner K.; and Kristensen, Steen, to Aktieselskabet de Danske Sukkerfabrikker. Method of purifying sugar juice prepared by extraction of a sugar beet material. 4,432,806, Cl. 127-48.000.
Maeda, Masatoshi: *See*—
Akanabe, Yuichi; Ikeda, Hiroaki; Maeda, Masatoshi; and Funaki, Shinsuke, 4,432,598, Cl. 350-6.700.
Maestri, Elio, to Romeo Maestri & Figli S.p.A. Tool for driving metal fasteners in a frame and setting its rear closing panel. 4,432,484, Cl. 227-126.000.
Mafix, Incorporated: *See*—
Richards, Malcolm E., 4,432,547, Cl. 273-65.00R.
Magnaflux Corporation: *See*—
Mlot-Fijalkowski, Adolf; and Borrows, Paul K., 4,433,289, Cl. 324-215.000.
Maier, Martin; and Ruprecht, Hermann, to Klockner-Humboldt-Deutz AG. Mower. 4,432,192, Cl. 56-15.300.
Maki, Melvin C., to 501 Control Data Canada, Ltd. Method of grading radiating transmission lines. 4,432,193, Cl. 57-3.000.
Malko, Vladimir R.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.
Mallinckrodt, Inc.: *See*—
Bevan, John A., 4,432,963, Cl. 424-1.100.
Maloney, Michael J.: *See*—
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.
Malott, Theodore A., to Clark Equipment Company. Lost motion transmission control cams. 4,432,251, Cl. 74-337.500.
Mameniskis, Walter A.: *See*—
Gupta, Vijai P.; Melpolder, Frank W.; and Mameniskis, Walter A., 4,433,173, Cl. 568-324.000.
Mannesmann Demag AG: *See*—
Bruderle, Egon U.; and Wannemacher, Willibald, 4,432,672, Cl. 405-268.000.
Manning, Monis J., to Polaroid Corporation. Optical element for photographic radiometer. 4,432,595, Cl. 350-1.100.
Mannschke, Lothar, to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH. Apparatus and method for coupling and decoupling of optical fiber waveguides. 4,432,601, Cl. 350-96.190.
Manoogian, David V.; Labitt, Bernard H.; and Wood, Joseph R., to United States of America, Army. Transmitter peak power efficient pseudo-blink arm decoy system. 4,433,333, Cl. 343-18.00E.
Manschot, James G.; Salvadori, Lawrence A.; and Plekenpol, David D., to Kendall Company, The. Fluid delivery system and method. 4,432,763, Cl. 604-262.000.
Manty, Brian A.; Eckler, Thomas A.; and Fujishiro, Shiro, to United Technologies Corporation. Fatique resistant tatanium alloy articles. 4,433,005, Cl. 427-38.000.
Marcinek, John A., to Emhart Industries, Inc. Mold-core rod combination for forming an injection molded plastic parison. 4,432,530, Cl. 249-142.000.
Marcon International Limited: *See*—
Richardson, Michael A., 4,432,667, Cl. 405-143.000.
Marcyan, Stanley T. High precision height comparator apparatus. 4,432,141, Cl. 33-169.00R.

Margolin, Mark, to TRW, Inc. Optical fiber clamp and connector assembly. 4,432,602, Cl. 350-96.200.

Margules, Gary S., to Cordis Corporation. Reference electrode catheter. 4,432,366, Cl. 128-635.000.

Marissen, Roelof H.: *See*—
Beune, Joannes H.; and Marissen, Roelof H., 4,432,395, Cl. 138-109.000.

Mark, Eino A.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Markovits, Gary: *See*—
Chye, Patrick W.; Hearn, Eric W.; Kulkarni, Murlidhar V.; and Markovits, Gary, 4,432,809, Cl. 148-1.500.

Marks, Alvin M. Charged aerosol wind/electric power generator with solar and/or gravitational regeneration. 4,433,248, Cl. 290-44.000.

Marlon, Anthony M. Procedure for introducing hyperalimentation catheters and the like. 4,432,752, Cl. 604-53.000.

Marshall, Christopher H.: *See*—
Abele, Manlio G.; and Marshall, Christopher H., 4,433,380, Cl. 564-414.000.

Marteau, Michel: *See*—
Ginisty, Claude; Marteau, Michel; and Mauborgne, Bernard, 4,432,946, Cl. 423-10.000.

Martin, Dennis E. Grooved coupling protector. 4,432,394, Cl. 138-96.00T.

Martin, Neil J. Automotive anti-theft device. 4,432,432, Cl. 180-287.000.

Martini, Jeanne M., to Consolidated Foods Corporation. Brassiere. 4,432,364, Cl. 128-484.000.

Martocci, Anthony P.: *See*—
Rudzki, Eugene M.; Jackson, Ronald W.; and Martocci, Anthony P., 4,432,657, Cl. 374-126.000.

Martucci, James P.: *See*—
Leckrone, Michael E.; and Martucci, James P., 4,432,362, Cl. 128-419.0PG.

Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, to Hitachi, Ltd. Thin film solar cell. 4,433,202, Cl. 136-255.000.

Marwitz, Heinrich; Ullrich, Kurt; and Huhn, Karl, to Wacker Chemie GmbH. Process for coating substrates with aqueous emulsions containing organopolysiloxanes. 4,433,007, Cl. 427-54.100.

Maschinenfabrik Schweiter AG: *See*—
Luz, Rudolf, 4,432,194, Cl. 57-22.000.

Mashita, Masao; Yasuda, Nobuaki; Ishibshi, Tomoyuki, deceased; and Ishibashi, Satoshi, legal representative, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical recording medium. 4,433,340, Cl. 346-135.100.

Mason, Anthony: *See*—
Kretchman, Gerald L.; and Mason, Anthony, 4,432,528, Cl. 248-603.000.

Masonite Corporation: *See*—
Hsu, Oscar H. H.; and Tassler, Milford C., 4,433,126, Cl. 527-105.000.

Massa, Frank, to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Ultrasonic transducers. 4,433,399, Cl. 367-157.000.

Mast, Robert E.: *See*—
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.

Mathisson, Goran; and Santen, Sven, to SKF Steel Engineering. Method of minimizing energy consumption when reducing iron oxide with reducing gases. 4,432,789, Cl. 75-35.000.

Matlock, Wallace M., to TRW Inc. Aluminum base material with hard facing deposit. 4,432,313, Cl. 123-193.00P.

Matsubara, Hirokazu: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.

Matsubara, Yuusaku: *See*—
Nishimura, Hiromi; Watari, Yoshie; and Matsubara, Yuusaku, 4,433,357, Cl. 361-196.000.

Matsuda, Akira; and Tojyo, Tetsuo, to Mitsui Petrochemical Industries, Ltd. Chlorinated rubber and polyvinyl chloride composition containing the same. 4,433,105, Cl. 525-211.000.

Matsuda, Hideaki: *See*—
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,433,124, Cl. 526-277.000.

Matsuda, Minoru: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,432,205, Cl. 60-605.000.

Matsuda, Mutsuhide: *See*—
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,432,621, Cl. 354-403.000.

Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, to Hitachi, Ltd. Cryogenic cooling apparatus. 4,432,216, Cl. 62-514.00R.

Matsuda, Yasushi; and Kawai, Shizuo, to Nippondenso Co., Ltd. Fuel injection pump device for internal combustion engine. 4,432,321, Cl. 123-380.000.

Matsui, Seiji: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,432,788, Cl. 75-3.000.

Matsumoto Seiyaku Kogyo Kabushiki Kaisha: *See*—
Sugiyama, Iwakichi; Endo, Kiyoshi; and Takaoka, Yukihisa, 4,433,127, Cl. 528-17.000.

Matsumura, Kaname: *See*—
Imamura, Junji; and Matsumura, Kaname, 4,432,744, Cl. 474-238.000.

Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, to Sumitomo Metal Industries, Ltd.; and Nippon Oil & Fats Co., Ltd. Electrodeposition of lubricative coating. 4,432,851, Cl. 204-181.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Azuma, Koichi; Nagasawa, Masahiro; Yamazoe, Hiroshi; and Aoki, Masaki, 4,433,408, Cl. 369-170.000.
Baba, Sueki; Yoshida, Tomio; Akahira, Nobuo; and Yamashita, Tadaoki, 4,433,403, Cl. 369-48.000.
Hamabe, Takeshi; and Nakamura, Tatsuya, 4,433,359, Cl. 361-273.000.
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.
Noguchi, Toyota; Kaneko, Mamoru; and Katoh, Hironori, 4,433,311, Cl. 332-11.00D.

Matsushita Electric Works Ltd.: *See*—
Nishimura, Hiromi; Watari, Yoshie; and Matsubara, Yuusaku, 4,433,357, Cl. 361-196.000.

Matt, Timothy S., to Nordson Corporation. Coating system control having a sensor interface with noise discrimination. 4,433,237, Cl. 250-222.100.

Matumoto, Kouzo: *See*—
Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, 4,432,216, Cl. 62-514.00R.

Matzen, Max, to Klockner-Humboldt-Deutz Aktiengesellschaft. Mechanical speed regulator for an injection pump. 4,432,704, Cl. 417-294.000.

Mauborgne, Bernard: *See*—
Ginisty, Claude; Marteau, Michel; and Mauborgne, Bernard, 4,432,946, Cl. 423-10.000.

Maurel, Pierre, to Uranium Pechiney Ugine Kuhlmann. Process for obtaining molybdenum as a useful product from molybdeniferous solutions containing alkali metal carbonate, sulphate, hydroxide or hydrogen carbonate and possibly uranium. 4,432,947, Cl. 423-55.000.

Maurer, Roger. Installation comprising a plurality of numerically controlled machine tools. 4,433,383, Cl. 364-474.000.

Mauser-Werke GmbH: *See*—
Wurzer, Ernst, 4,432,718, Cl. 425-466.000.

Mautz, Karlheinz: *See*—
Stephan, Michael; Mautz, Karlheinz; and Schwarz, Alois, 4,432,696, Cl. 416-134.00A.

May, Paul W., Jr.: *See*—
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., 4,433,089, Cl. 524-294.000.

Maye, Robert A.: *See*—
Garvey, Louis P.; and Maye, Robert A., 4,432,575, Cl. 292-341.180.

Mayer, Herbert E., to Censor Patent-und Versuchs-Anstalt. Temperature-controlled support for semiconductor wafer. 4,432,635, Cl. 355-30.000.

Mayland, Harold E. Apparatus for releasably bridging a well. 4,432,418, Cl. 166-133.000.

Mazeau, Jean P.: *See*—
Courbin, Philippe L. P.; and Mazeau, Jean P., 4,433,062, Cl. 501-44.000.

McAusland, Robert R., to Advanced Technology Laboratories, Inc. Ultrasound scanhead. 4,432,371, Cl. 128-660.000.

McCalmont, Arnold M.; and Slate, Matthew W., to Technical Communications Corporation. Privacy communication system employing time/frequency transformation. 4,433,211, Cl. 179-1.50S.

McClung, Thomas E. Fire escape system. 4,432,437, Cl. 182-234.000.

McDonnell Douglas Corporation: *See*—
Farris, John R.; and Tucci, Allan T., 4,432,302, Cl. 118-410.000.

McFarlane, John; and Guy, Andrew, to Sonell Products Limited. Fuel economizer devices. 4,432,332, Cl. 123-587.000.

McGregor, Harold R. Automatic bag hanger. 4,432,186, Cl. 53-69.000.

McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., to United States of America, Energy. Method for synthesizing HMX. 4,432,902, Cl. 260-239.0HM.

McIntire, William R., to United States of America, Energy. Receiver for solar energy collector having improved aperture aspect. 4,432,345, Cl. 126-439.000.

McKewan, Arthur J., to Microdot Inc. Threaded fastener assembly. 4,432,682, Cl. 411-311.000.

McLain, Stephan J.; and Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Phosphine azacrown ether compounds. 4,432,904, Cl. 260-330.600.

McLane, Wesley: *See*—
Norman, Deumite; Brannagan, James P.; and McLane, Wesley, 4,432,289, Cl. 110-336.000.

McLeod, David M., to Dow Chemical Company, The. Apparatus for mixing vapor and liquid phases of anhydrous ammonia. 4,432,651, Cl. 366-336.000.

McMahon, Donald H., to Sperry Corporation. Fiber optic differential sensor. 4,432,599, Cl. 350-96.150.

McMillan, Charles. Ice tray with lid. 4,432,529, Cl. 249-52.000.

McNeill, William H.; and Chen, Yung J., to GTE Laboratories Incorporated. High frequency light modulator. 4,432,614, Cl. 350-386.000.

Meca: *See—*
Raisin, Jean-Pierre; Helffer, Bernard; and Chirouze, Jean L., 4,432,295, Cl. 112-262.300.
Mechanical Enterprises, Inc.: *See—*
Twyford, Robert H., 4,433,317, Cl. 335-151.000.
Mechanical Technology Incorporated: *See—*
Bhate, Suresh K., 4,433,279, Cl. 322-3.000.
Walsh, Michael M., 4,432,204, Cl. 60-520.000.
Medi-Tech, Incorporated: *See—*
Halvorsen, Kenneth G., 4,432,369, Cl. 128-653.000.
Medtronic, Inc.: *See—*
Dickhudt, Eugene A., 4,432,377, Cl. 128-786.000.
Monroe, Paul P., 4,432,372, Cl. 128-675.000.
Meetze, Murray O., Jr., to Risdon Enterprises, Inc. Apparatus for creating a flow of air past a product capable of being vaporized. 4,432,938, Cl. 422-49.000.
Mehler, Gunter: *See—*
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.
Melchior, Jean F.; and Andre, Thierry M., to French State, The. Supercharged internal combustion engines, in particular diesel engines, and in methods for starting up and regulating the speed of these engines. 4,432,206, Cl. 60-606.000.
Melin, Kent: *See—*
Lind, Lars; Melin, Kent; and Sandberg, Lars, 4,432,430, Cl. 180-197.000.
Melpolder, Frank W.: *See—*
Gupta, Vijai P.; Melpolder, Frank W.; and Mameniskis, Walter A., 4,433,173, Cl. 568-324.000.
Menasha Corporation: *See—*
Swingley, Harold E., Jr., 4,432,467, Cl. 220-334.000.
Menet, Albert: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,433,171, Cl. 568-33.000.
Menzimer, David A.: *See—*
Haddick, David H.; Lyon, George E.; and Menzimer, David A., 4,433,345, Cl. 358-244.000.
Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,432,992, Cl. 424-274.000.
Gullo, Vincent P.; Lam, Tony Y. K.; and Monaghan, Richard L., 4,432,996, Cl. 424-311.000.
Merten, Rudolf: *See—*
Rottmaier, Ludwig; and Merten, Rudolf, 4,433,085, Cl. 524-83.000.
Rottmaier, Ludwig; and Merten, Rudolf, 4,433,144, Cl. 544-198.000.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
Stephan, Michael; Mautz, Karlheinz; and Schwarz, Alois, 4,432,696, Cl. 416-134.00A.
Metallurgie Hoboken-Overpelt: *See—*
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,951, Cl. 423-89.000.
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,952, Cl. 423-89.000.
Meyer, Carl R.: *See—*
Kleinert, Werner L., 4,432,173, Cl. 52-167.700.
Meyer, Hans R., to Ciba-Geigy Corporation. Cationic fluorescent whitening agents. 4,432,886, Cl. 252-301.270.
Meyer, Wolfgang H.; and Curtis, Bernard J., to RCA Corporation. Dry developable positive photoresists. 4,433,044, Cl. 430-271.000.
Meylink, John G.: *See—*
Hutchison, Wayne R.; and Meylink, John G., 4,432,309, Cl. 123-41.660.
Michl, Franz: *See—*
Grage, Ludger; Ryseck, Werner; and Michl, Franz, 4,432,640, Cl. 356-5.000.
Microdot Inc.: *See—*
McKewan, Arthur J., 4,432,682, Cl. 411-311.000.
Middy, Gerald W. Solar insolation and concentration by coupled fiber optics. 4,433,199, Cl. 136-246.000.
Midwec Toroid & Capacitor Corporation: *See—*
Noetzelmann, David C., Sr., 4,433,208, Cl. 178-46.000.
Milionis, Jerry P.; and Fischer, Joel E., to American Cyanamid Company. Concentrated emetic herbicidal composition and method for the preparation thereof. 4,432,787, Cl. 71-94.000.
Miller, Donald R.: *See—*
Brantley, Vanston R.; and Miller, Donald R., 4,432,232, Cl. 73-432.00R.
Miller, Earl, to Larco Products, Inc. Fishing rod. 4,432,155, Cl. 43-22.000.
Miller, Ira: *See—*
Davies, Robert B.; and Miller, Ira, 4,433,302, Cl. 330-257.000.
Miller, Kenneth A., to Ireco Chemicals. Detonation cut-off device. 4,432,268, Cl. 86-1.00R.
Miller, Peter S., to Owens-Illinois, Inc. Splice-in-register control. 4,432,481, Cl. 226-9.000.
Miller, Walter, to Dr. Johannes Heidenhain GmbH. Apparatus for programming numerically path controlled processing devices. 4,433,373, Cl. 364-171.000.
Milligan, Lowell R.: *See—*
Moriarty, Keith A.; and Milligan, Lowell R., 4,432,143, Cl. 33-178.00F.
Mills, Carl R., to Chicago Fluid Power Corp. Accumulator. 4,432,393, Cl. 138-30.000.
Ministry of International Trade & Industry: *See—*
Harata, Kazuaki; Morimoto, Satoshi; and Tsuda, Keishiro, 4,432,802, Cl. 106-163.00R.
Minnesota Mining and Manufacturing Company: *See—*
Eian, Gilbert L., 4,433,024, Cl. 428-198.000.
Kuykendall, Charles R.; and Castle, Richard B., 4,432,172, Cl. 52-98.000.
Vogelgesang, Peter J., 4,433,351, Cl. 360-76.000.
Wyatt, Gerald A., 4,433,356, Cl. 361-191.000.
Minning, Rudolf; and Dierkes, Heribert, to UHDE GmbH. Process for the manufacture of double walled pipe. 4,432,123, Cl. 29-157.00A.
Minns, Richard A.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,433,132, Cl. 528-191.000.
Minolta Camera Kabushiki Kaisha: *See—*
Tabuchi, Kenji, 4,432,634, Cl. 355-14.00D.
Misawa, Rintaro, to Sunwa Sharyo Manufacturing Company Limited. Stair climbing wheelchair carrier. 4,432,426, Cl. 180-8.00A.
Mita Industrial Co. Ltd.: *See—*
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,433,039, Cl. 430-58.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Ohta, Kazutoshi; and Sakakibara, Kunio, 4,433,023, Cl. 428-182.000.
Mitsubishi Gas Chemical Company Inc.: *See—*
Miyamoto, Akira; Shimizu, Senzo; Yamamiya, Kazuo; and Harada, Masahiro, 4,433,136, Cl. 528-347.000.
Mitsubishi Petrochemical Company, Ltd.: *See—*
Sano, Hironari; and Yui, Hiroshi, 4,433,073, Cl. 523-201.000.
Mitsubishi Rayon Company Ltd.: *See—*
Kamata, Kazumasa; and Tateyama, Masamitsu, 4,433,103, Cl. 525-81.000.
Mitsuboshi Belting Ltd.: *See—*
Imamura, Junji; and Matsumura, Kaname, 4,432,744, Cl. 474-238.00.
Mitsui Petrochemical Industries, Ltd.: *See—*
Kabu, Yasunori; Yasunaka, Masayoshi; Morita, Yoshinori; and Motowoka, Masanori, 4,433,121, Cl. 526-68.000.
Matsuda, Akira; and Tojyo, Tetsuo, 4,433,105, Cl. 525-211.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, 4,433,133, Cl. 528-232.000.
Mitsuwa Kogya Co., Ltd.: *See—*
Wakimura, Kazuo, 4,432,544, Cl. 273-1.00M.
Mittleman, Herbert; and Boland, Gordon P., to Baxter Travenol Laboratories, Inc. Administration set including burette with pivotable air valve. 4,432,760, Cl. 604-246.000.
Miura, Haruo; and Abe, Yoshiaki, to Hitachi, Ltd. Rotor of axial-flow machine. 4,432,697, Cl. 416-198.00A.
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, to Mita Industrial Co. Ltd. Trisazo electrophotographic photosensitive material. 4,433,039, Cl. 430-58.000.
Miyamoto, Akira; Shimizu, Senzo; Yamamiya, Kazuo; and Harada, Masahiro, to Mitsubishi Gas Chemical Company Inc. Process for preparing polyamide in uniformly fluidized state. 4,433,136, Cl. 528-347.000.
Miyamoto, Shigenobu: *See—*
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.
Miyatake, Tatsuya: *See—*
Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, 4,433,110, Cl. 525-323.000.
Miyawaki, Yoshinori: *See—*
Ogawa, Hiroshi; Kimura, Syozi; and Miyawaki, Yoshinori, 4,432,373, Cl. 128-680.000.
Miyazaki, Masaru: *See—*
Nakamura, Kazumitsu; and Miyazaki, Masaru, 4,433,243, Cl. 250-397.000.
Mizoguchi, Allan H.: *See—*
Christensen, James M.; and Mizoguchi, Allan H., 4,432,361, Cl. 128-419.00F.
Mizokami, Kazunori, to Olympus Optical Company, Ltd. Apparatus for communicating information relating to taking lens. 4,432,627, Cl. 354-289.100.
Mlot-Fijalkowski, Adolf; and Borrows, Paul K., to Magnaflux Corporation. Method for inspecting steel billets with a dry mixture of magnetic particles and a water soluble carrier solid. 4,433,289, Cl. 324-215.000.
Mobay Chemical Corporation: *See—*
Santimauro, John F., 4,432,796, Cl. 106-19.000.
Mobil Oil Corporation: *See—*
Chu, Chin-Chiun, 4,433,186, Cl. 585-445.000.
Hungerford, Gordon P., 4,432,917, Cl. 264-40.100.
Tabak, Samuel A., 4,433,185, Cl. 585-312.000.
Young, Lewis B., 4,433,189, Cl. 585-640.000.
Mochizuki, Masafumi: *See—*
Saito, Takashi; and Mochizuki, Masafumi, 4,433,405, Cl. 369-77.200.
Saito, Takashi; Mochizuki, Masafumi; and Arai, Norimasa, 4,433,406, Cl. 369-77.200.
Modern Precision Engineers and Associates Limited: *See—*
Clements, Harold J., 4,432,429, Cl. 180-127.000.
Modulite Corporation: *See—*
Weber, Franz K., 4,433,363, Cl. 362-86.000.

Moise, Gervais: *See*—
Castagner, Bernard; Carre, Paul; and Moise, Gervais, 4,432,269, Cl. 89-1.816.

Molde, Bradley J., to Standard Textile Company, Inc. Cloth-like material for forming a surgical gown and/or a surgical drape and method of making the same. 4,433,026, Cl. 428-252.000.

Molina, Jorge W., to Deutsch Fastener Corp. Stressed panel fastener. 4,432,680, Cl. 411-103.000.

Molison, Robert E.: *See*—
Elsner, Bertram F.; and Molison, Robert E., 4,432,187, Cl. 53-137.000.

Monaghan, Richard L.: *See*—
Gullo, Vincent P.; Lam, Tony Y. K.; and Monaghan, Richard L., 4,432,996, Cl. 424-311.000.

Monk, John T. Straddle carrier. 4,432,690, Cl. 414-460.000.

Monnier, Charles E.: *See*—
Lohse, Friedrich; and Monnier, Charles E., 4,433,179, Cl. 568-664.000.

Monroe, Paul P., to Medtronic, Inc. Two-lead power/signal multiplexed transducer. 4,432,372, Cl. 128-675.000.

Monsanto Company: *See*—
Coran, Aubert Y.; and Trivette, Chester D., Jr., 4,433,114, Cl. 525-332.600.
D'Amico, John J., 4,432,785, Cl. 71-90.000.
Harris, Alva F., 4,433,086, Cl. 524-112.000.
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., 4,433,089, Cl. 524-294.000.
Knorr, Raymond S.; Chandler, Joe D.; and Tran, Loi N., 4,433,122, Cl. 526-83.000.
Long, Walter E., 4,433,249, Cl. 307-31.000.
Santer, J. Owen; and Spitz, George T., 4,433,143, Cl. 544-196.000.
Singleton, Thomas C., 4,433,165, Cl. 562-519.000.
Singleton, Thomas C.; and Paulik, Frank E., 4,433,166, Cl. 562-519.000.
Van Eenam, Donald N., 4,433,090, Cl. 524-295.000.

Monteleone, Jerry: *See*—
Monteleone, Nick; Monteleone, Jerry; and Monteleone, Lorenzo, 4,432,125, Cl. 29-402.080.

Monteleone, Lorenzo: *See*—
Monteleone, Nick; Monteleone, Jerry; and Monteleone, Lorenzo, 4,432,125, Cl. 29-402.080.

Monteleone, Nick; Monteleone, Jerry; and Monteleone, Lorenzo. Hinge pin removal tool. 4,432,125, Cl. 29-402.080.

Montres Rolex S.A.: *See*—
Zaugg, Edmond, 4,433,295, Cl. 324-429.000.

Moore, Arnold R., to RCA Corporation. Method and apparatus for determining minority carrier diffusion length in semiconductors. 4,433,288, Cl. 324-158.00D.

Moore, Hazel M. Cowboy rodeo contest game. 4,432,553, Cl. 273-244.000.

Moore, William J., to Kimberly Clark Corporation. Method and apparatus for manufacturing elastic leg disposable diapers. 4,432,823, Cl. 156-164.000.

Moplefan S.p.A.: *See*—
Cacciapuoti, Beniamino, 4,432,397, Cl. 139-13.00R.

Morelli, Luigi: *See*—
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., 4,433,286, Cl. 324-61.00R.

Morency, Roger L.; and Olin, Lester D., to United States of America, Navy. Multichannel fiber optics connector. 4,432,603, Cl. 350-96.210.

Morgachev, Ivan I.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Morgan, Albert W.: *See*—
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., 4,433,089, Cl. 524-294.000.

Morgan, Grover D., to United States of America, Energy. Dual circuit embossed sheet heat transfer panel. 4,432,414, Cl. 165-140.000.

Mori, Hisakazu: *See*—
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,433,124, Cl. 526-277.000.

Mori, Sachio: *See*—
Ogawa, Yasunao; Noto, Akira; Mori, Sachio; and Yoshioka, Mitsuru, 4,433,139, Cl. 536-17.200.

Moriarity, Thomas C.; and Geiger, William J., to PPG Industries, Inc. Ungelled polyepoxide-polyoxyalkylenepolyamine resins, aqueous dispersions thereof, and their use in cationic electrodeposition. 4,432,850, Cl. 204-181.00C.

Moriarty, Keith A.; and Milligan, Lowell R., to Dresser Industries, Inc. Well logging apparatus. 4,432,143, Cl. 33-178.00F.

Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, to Daiwa Can Company, Limited. Electrode roll for resistance welding. 4,433,229, Cl. 219-84.000.

Morimoto, Satoshi: *See*—
Harata, Kazuaki; Morimoto, Satoshi; and Tsuda, Keishiro, 4,432,802, Cl. 106-163.00R.

Morimoto, Tadashi: *See*—
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.

Morishita, Hirosada: *See*—
Kawanishi, Tsuneaki; Mukoh, Akio; Morishita, Hirosada; and Hoshi, Nobuyoshi, 4,433,042, Cl. 430-126.000.

Morita, Akiro; and Watanabe, Isamu, to Riken Denshi Co., Ltd. Range switching device for electric meter. 4,433,287, Cl. 324-115.000.

Morita, Eiichi: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.

Morita, Yasuyuki; and Oda, Hiroyuki, to Toyo Kogyo Co., Ltd. Ignition arrangement for internal combustion engine. 4,432,315, Cl. 123-310.000.

Morita, Yoshinori: *See*—
Kabu, Yasunori; Yasunaka, Masayoshi; Morita, Yoshinori; and Motowoka, Masanori, 4,433,121, Cl. 526-68.000.

Morita, Yukio: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.

Moriya, Kazuo: *See*—
Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, 4,432,643, Cl. 356-312.000.

Moriyama, Masuyoshi: *See*—
Honzawa, Yatsuhiro; Moriyama, Masuyoshi; and Iwamori, Hidekazu, 4,432,702, Cl. 417-269.000.

Morris Rod-Weeder Co. Ltd.: *See*—
Machnee, Cecil B., 4,432,675, Cl. 406-30.000.

Morris, Stanley. Advertising display apparatus. 4,432,151, Cl. 40-10.00D.

Morrison-Knudsen Forest Products Company, Inc.: *See*—
Logan, James D., 4,432,916, Cl. 264-24.000.

Morsch, Joachim: *See*—
Beutler, Gerhard; Berthold, Heinz; Morsch, Joachim; and Schiene, Karl, 4,432,703, Cl. 417-217.000.

Morse Boulger, Inc.: *See*—
Brillantes, Bonifacio B., 4,432,287, Cl. 110-212.000.

Moser, Gottfried; and Gross, Hansjurgen, to Klockner-Humboldt-Deutz AG. System for heating the service cabin of a machine. 4,432,493, Cl. 237-12.30R.

Moses, Donald W.; Hustig, Charles; and Ballard, C. Ray, to Applied Spectrum Technologies, Inc. Telephone line interface circuit. 4,433,212, Cl. 179-2.00C.

Motojima, Kenji: *See*—
Kamiya, Kunio; Motojima, Kenji; Funabashi, Kiyomi; Chino, Koichi; and Horiuchi, Susumu, 4,432,894, Cl. 252-632.000.

Motorola, Inc.: *See*—
Davies, Robert B.; and Miller, Ira, 4,433,302, Cl. 330-257.000.
Dolikian, Arman V., 4,433,256, Cl. 307-358.000.
Jasinski, Leon, 4,433,214, Cl. 179-115.5ES.

Motowoka, Masanori: *See*—
Kabu, Yasunori; Yasunaka, Masayoshi; Morita, Yoshinori; and Motowoka, Masanori, 4,433,121, Cl. 526-68.000.

Mozer, Forrest S. Method and apparatus for time domain compression and synthesis of audible signals. 4,433,434, Cl. 381-30.000.

MPD Technology Corporation: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.

Mross, Wolf D.: *See*—
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,433,188, Cl. 585-640.000.

Muhlke, John, III: *See*—
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., 4,433,286, Cl. 324-61.00R.

Muise, Herbert D., to Weyerhaeuser Company. Container packaging for cups. 4,432,491, Cl. 229-33.000.

Muka, Richard S.; and Russo, Carl J., to Varian Associates, Inc. Blackbody radiation source for producing constant planar energy flux. 4,433,246, Cl. 250-492.100.

Mukoh, Akio: *See*—
Kawanishi, Tsuneaki; Mukoh, Akio; Morishita, Hirosada; and Hoshi, Nobuyoshi, 4,433,042, Cl. 430-126.000.

Muller, Max; Lilly, Eugene B.; and Bott, Richard E. Machine for cleaning shoe soles. 4,432,112, Cl. 15-36.000.

Mumford, George V.; and Li, Ernest L., to Owens-Illinois, Inc. Tamper indicating package. 4,432,461, Cl. 215-252.000.

Mumford, Van E.; Sasmor, Louis; and Schroeppel, Edward A., to Cordis Corporation. Interactive programmer for biomedical implantable devices. 4,432,360, Cl. 128-419.0PG.

Munekata, Katsusuke; Furuno, Hiroshi; and Someno, Noboru, to Sony Corporation. Timer apparatus. 4,432,652, Cl. 368-69.000.

Munzer, Rudolf: *See*—
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.

Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, to Japan Carlit Co., Ltd., The. Apparatus for manufacturing chlorine dioxide. 4,432,856, Cl. 204-237.000.

Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, to Nippon Chemiphar Co., Ltd. Amidinopiperidine derivatives. 4,433,152, Cl. 546-193.000.

Murano, Tamio: *See*—
Kawashima, Ikue; Fukushima, Yoshio; Murano, Tamio; and Suzuki, Toshitatsu, 4,432,622, Cl. 354-408.000.

Murata Kikai Kabushiki Kaisha: *See*—
Ueda, Yutaka; and Ikeda, Isamu, 4,432,197, Cl. 57-261.000.

Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro; and Kumada, Akira, 4,433,320, Cl. 338-35.000.

Nishiyama, Hiroshi; and Nakamura, Takeshi, 4,433,264, Cl. 310-321.000.
Wakino, Kikuo; and Arakawa, Yoshio, 4,433,360, Cl. 361-305.000.
Murata, Michihiro; and Kumada, Akira, to Murata Manufacturing Co., Ltd. Dew sensor. 4,433,320, Cl. 338-35.000.
Murata, Yoshihumi: *See*—
Takayanagi, Motowo; and Murata, Yoshihumi, 4,433,117, Cl. 525-425.000.
Murayama, Morio: *See*—
Ishikawa, Norio; Murayama, Morio; and Nishijima, Yasumoto, 4,432,920, Cl. 264-49.000.
Murayama, Yoshimasa: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Musall, Reimar; and Wolsing, Wilhelm, to Kali-Chemie AG. Elastic suspension for a monolithic catalyst body in a exhaust gas cleaning device. 4,432,943, Cl. 422-179.000.
Muscatell, Ralph P. Variable airfoil assembly. 4,432,516, Cl. 244-219.000.
Musch, Rudiger; Konter, Wolfgang; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Production of sulphur-modified polychloroprene rubbers. 4,433,106, Cl. 525-215.000.
Musto, Dominick J.; and Lerner, Harold, to Austin Company, The. Multiple dimension laser gauge. 4,432,648, Cl. 356-387.000.
Myers, George D.; and Busch, Lloyd E., to Ashland Oil, Inc. Carbo-metallic oil conversion with liquid water containing H_2S. 4,432,864, Cl. 208-120.000.
Myers, George D., deceased (by Myers, Virginia K., administratrix); Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., to Ashland Oil, Inc. Steam reforming of carbo-metallic oils. 4,432,863, Cl. 208-113.000.
Myers, Virginia K., administratrix: *See*—
Myers, George D., deceased; Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., 4,432,863, Cl. 208-113.000.
Mysels, Karol J.: *See*—
Wrasidlo, Wolfgang J.; and Mysels, Karol J., 4,432,875, Cl. 210-500.200.
N-Viro Energy Systems Ltd.: *See*—
Kneller, William A.; and Nicholson, John P., 4,432,800, Cl. 106-85.000.
Nabisco Brands, Inc.: *See*—
Zekert, Gerhard C.; and DeArment, Donald K., 4,432,275, Cl. 99-625.000.
Nadzan, Alex M.; and Granneman, George R., to Abbott Laboratories. N-alkylated carboxylic acid derivatives as anti-convulsant agents. 4,432,985, Cl. 424-267.000.
Naegele, Paul: *See*—
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,433,112, Cl. 525-326.900.
Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,433,255, Cl. 307-353.000.
Nagasaki, Tatsuo, to Olympus Optical Co., Ltd. Signal processing circuit of ultrasonic diagnostic apparatus. 4,432,236, Cl. 73-631.000.
Nagasawa, Masahiro: *See*—
Azuma, Koichi; Nagasawa, Masahiro; Yamazoe, Hiroshi; and Aoki, Masaki, 4,433,408, Cl. 369-170.000.
Nagashima, Shigeo: *See*—
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,433,394, Cl. 365-221.000.
Nagata, Minoru: *See*—
Kaneko, Kenji; Okabe, Takahiro; Nagata, Minoru; and Okada, Yutaka, 4,433,258, Cl. 307-456.000.
Naito, Yoshikazu: *See*—
Okuyama, Nobutaka; Shimizu, Toshiharu; and Naito, Yoshikazu, 4,433,318, Cl. 335-213.000.
Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic musical performance device capable of controlling the tempo. 4,432,266, Cl. 84-1.030.
Nakagawa, Junzo: *See*—
Kuwayama, Kenta; Nakagawa, Junzo; Tomii, Keishi; and Hagimori, Kenji, 4,432,937, Cl. 420-513.000.
Nakagawa, Masao: *See*—
Senda, Kenichi; Nishida, Tatehiko; and Nakagawa, Masao, 4,433,029, Cl. 428-407.000.
Nakagawa, Satoshi: *See*—
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,433,046, Cl. 430-385.000.
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, to Yokogawa Hokushin Electric Corporation. Multiple-color recording apparatus. 4,433,338, Cl. 346-34.000.
Nakagawa, Yasushi: *See*—
Suzuki, Ichiro; Nakagawa, Yasushi; and Kitagawa, Naoto, 4,432,565, Cl. 280-779.000.
Nakagawa, Yoshihiro: *See*—
Nakamura, Shiro; Nakagawa, Yoshihiro; and Hashimoto, Takashi, 4,433,032, Cl. 428-682.000.
Nakamichi, Fujio: *See*—
Shirakuma, Takashi; Nakamichi, Fujio; and Iguchi, Osamu, 4,432,698, Cl. 417-27.000.
Nakamura, Fujio: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.
Nakamura, Kazumitsu; and Miyazaki, Masaru, to Hitachi, Ltd. Electron beam exposure apparatus. 4,433,243, Cl. 250-397.000.
Nakamura, Shiro; Nakagawa, Yoshihiro; and Hashimoto, Takashi, to Kubota Ltd. High chrome work roll. 4,433,032, Cl. 428-682.000.
Nakamura, Takeshi: *See*—
Nishiyama, Hiroshi; and Nakamura, Takeshi, 4,433,264, Cl. 310-321.000.
Nakamura, Tatsuya: *See*—
Hamabe, Takeshi; and Nakamura, Tatsuya, 4,433,359, Cl. 361-273.000.
Nakatsugawa, Shigekazu, to Yamasa Shoyu Kabushiki Kaisha. Enhancer of anti-tumor effect. 4,432,348, Cl. 128-1.100.
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing non-fired iron-bearing pellet. 4,432,788, Cl. 75-3.000.
Nakayama, Yoshihiko: *See*—
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,432,212, Cl. 62-229.000.
Nalco Chemical Company: *See*—
Whitfield, Joyce M.; and Cosper, David R., 4,432,834, Cl. 162-158.000.
Naoumidis, Aristides: *See*—
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.
Napp, E. Thomas; Stauber, R. C.; and Lillegard, Thomas R., to Baxter Travenol Laboratories, Inc. Ultrasonic level detector. 4,432,231, Cl. 73-290.00V.
Nara, Akio: *See*—
Tsuchiya, Keiji; Sasaya, Hideaki; and Nara, Akio, 4,432,711, Cl. 418-150.000.
Nari, Dario: *See*—
De Gasperi, Mario M.; Racciu, Antonio; and Nari, Dario, 4,433,385, Cl. 364-554.000.
Narukawa, Hiroshi; Tada, Rentaro; Takeuchi, Yasuhira; and Ohara, Osamu, to Kuraray Co., Ltd. Sheet-like material, heat-insulating material derived therefrom and methods of manufacturing same. 4,433,020, Cl. 428-113.000.
Nashiki, Masayuki; and Hamada, Yoshio, to Kabushiki Kaisha Okuma Tekkosho. Rotor for permanent magnet type synchronous motors. 4,433,261, Cl. 310-156.000.
National Starch and Chemical Corp.: *See*—
Szymanski, Chester D., 4,432,967, Cl. 424-78.000.
National Steel Corporation: *See*—
Honeycutt, LeRoy, III, 4,432,846, Cl. 204-129.950.
Navarre, Robert J. Eaves trough bracket assembly. 4,432,518, Cl. 248-48.200.
Naylor, Raymond L.: *See*—
Banks, William D.; Bond, Frank G.; and Naylor, Raymond L., 4,433,251, Cl. 307-246.000.
NCR Corporation: *See*—
Oosterbaan, DuWayne D., 4,433,388, Cl. 364-900.000.
Thomas, Jacob E., 4,433,341, Cl. 346-140.00R.
Neal, James W.: *See*—
Loersch, Joseph F.; and Neal, James W., 4,432,220, Cl. 72-53.000.
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., to PPG Industries, Inc. Multiple glazed unit bonded with fiber-reinforced silicate cement. 4,433,016, Cl. 428-34.000.
Neff, Leslie A. Log cutting device having log shifting means. 4,432,449, Cl. 198-777.000.
Negi, Shigeto: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.
Neil and Spencer Limited: *See*—
Banks, Clifford G., 4,432,149, Cl. 38-55.000.
Nemeth, Joseph, to Champion Spark Plug Company. Green ceramic of lead-free glass, conductive carbon, silicone resin and $AlPO_4$, useful, after firing, as an electrical resistor. 4,433,092, Cl. 524-414.000.
Neulinger, Franz: *See*—
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.
Neuner, Otto: *See*—
Idel, Karsten; Freitag, Dieter; Bottenbruch, Ludwig; and Neuner, Otto, 4,433,138, Cl. 528-388.000.
Neusser, Hans J.: *See*—
Boesl, Ulrich; Neusser, Hans J.; and Schlag, Edward W., 4,433,241, Cl. 250-282.000.
Neville Chemical Company: *See*—
Laurito, James J., 4,433,100, Cl. 525-54.420.
Nevitt, Thomas D.: *See*—
Sikkenga, David L.; Nevitt, Thomas D.; and Jerome, Norman F., 4,433,190, Cl. 585-660.000.
New England Nuclear Corporation: *See*—
Tzodikov, Nathan R., 4,432,877, Cl. 210-656.000.
Newkirk, Randall A. Receptacle tampering indicator and method therefor. 4,432,462, Cl. 215-365.000.
Nezuka, Kenjiro, to Dresser Industries, Inc. Emergency brake system. 4,432,585, Cl. 303-10.000.

Nicholas, William M. Balancing bird. 4,432,158, Cl. 46-131.000.
Nicholson, John P.: *See*—
Kneller, William A.; and Nicholson, John P., 4,432,800, Cl. 106-85.000.
Nicholson, Margie M.; and Pizzarello, Frank A., to Rockwell International Corporation. Phthalocyanine electrochromic display with improved cycle life. 4,432,612, Cl. 350-357.000.
Nickel, Hubertus: *See*—
Gupta, Ashok K.; Gyarmati, Erno; Kreutz, Hermann; Munzer, Rudolf; Naoumidis, Aristides; and Nickel, Hubertus, 4,432,957, Cl. 423-345.000.
Nielsen, Werner K.: *See*—
Madsen, Rud F.; Nielsen, Werner K.; and Kristensen, Steen, 4,432,806, Cl. 127-48.000.
Nihon Kaiheiki Industrial Company, Ltd.: *See*—
Kodaira, Yasuo, 4,433,222, Cl. 200-153.00J.
Nii, Katsutoshi; Okano, Kinpei; Doi, Motomichi; and Kitsuya, Minoru, to Hitachi, Ltd. X-Ray tube apparatus. 4,433,432, Cl. 378-193.000.
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, to Hodogaya Chemical Company, Ltd. Electrophotographic toner containing a metal complex dye. 4,433,040, Cl. 430-109.000.
Niiro, Yasuhiko; and Ejiri, Yoshihiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical fiber submarine cable. 4,432,605, Cl. 350-96.230.
Ninomiya, Ken: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Nippi, Inc.: *See*—
Sawada, Yoshikatu; Shirakawa, Kazuo; and Sugiura, Takeo, 4,433,043, Cl. 430-175.000.
Nippon Chemiphar Co., Ltd.: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.
Nippon Electric Co., Ltd.: *See*—
Kubo, Yoshimi; Shimizu, Shigeaki; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,432,935, Cl. 419-2.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nakada, Akira, 4,432,266, Cl. 84-1.030.
Noro, Masao, 4,433,369, Cl. 363-84.000.
Oya, Akiyoshi; and Sekiguchi, Tomoaki, 4,432,265, Cl. 84-1.010.
Yokoyama, Kenji, 4,433,307, Cl. 330-297.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Ogawa, Masanobu; and Kojima, Toshitake, 4,433,167, Cl. 562-534.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,432,788, Cl. 75-3.000.
Nippon Oil Co., Ltd.: *See*—
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, 4,433,098, Cl. 524-811.000.
Nippon Oil & Fats Co., Ltd.: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.
Nippon Soda Company Limited: *See*—
Kobayashi, Noriyuki; and Funamoto, Akihiko, 4,433,079, Cl. 523-404.000.
Nippon Soken, Inc.: *See*—
Kodera, Masao; and Akita, Shigeyuki, 4,433,398, Cl. 367-140.000.
Tsuchiya, Keiji; Sasaya, Hideaki; and Nara, Akio, 4,432,711, Cl. 418-150.000.
Nippondenso Co., Ltd.: *See*—
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, 4,432,322, Cl. 123-416.000.
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.
Kataoka, Masami; and Higo, Nobumasa, 4,432,244, Cl. 73-861.770.
Matsuda, Yasushi; and Kawai, Shizuo, 4,432,321, Cl. 123-380.000.
Okano, Reijiro; and Usami, Kiyoshi, 4,432,446, Cl. 192-84.00C.
Nishida, Osamu: *See*—
Shida, Shigeru; Hosaka, Nobuyoshi; Ishikawa, Yuichi; and Nishida, Osamu, 4,433,093, Cl. 524-433.000.
Nishida, Takashi: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.
Nishida, Tatehiko: *See*—
Senda, Kenichi; Nishida, Tatehiko; and Nakagawa, Masao, 4,433,029, Cl. 428-407.000.
Nishijima, Yasumoto: *See*—
Ishikawa, Norio; Murayama, Morio; and Nishijima, Yasumoto, 4,432,920, Cl. 264-49.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process involving simultaneous charging and imaging. 4,433,038, Cl. 430-55.000.
Nishikawa, Yukiyasu: *See*—
Itoh, Kiyoshi; Nishikawa, Yukiyasu; Hoshika, Shuji; and Okamoto, Ikuzo, 4,432,617, Cl. 351-211.000.
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, to Hitachi, Ltd. Microwave plasma source. 4,433,228, Cl. 219-10.55R.
Nishimura, Hiromi; Watari, Yoshie; and Matsubara, Yuusaku, to Matsushita Electric Works Ltd. Drive circuit for a latching relay. 4,433,357, Cl. 361-196.000.
Nishiyama, Hiroshi; and Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Electrode structure for a zinc oxide thin film. 4,433,264, Cl. 310-321.000.
Nissan Motor Company, Limited: *See*—
Katahira, Hiroaki; and Kobayashi, Shigeru, 4,432,213, Cl. 62-239.000.
Kita, Toru, 4,432,241, Cl. 73-861.220.
Ogawa, Naoki, 4,432,433, Cl. 181-204.000.
Shimizu, Seiichi; and Iguchi, Kouichi, 4,432,328, Cl. 123-516.000.
Ujihara, Shin; and Yoshizawa, Takashi, 4,432,222, Cl. 72-350.000.
Watanuki, Yoshio, 4,432,167, Cl. 49-502.000.
Yasuhara, Seishi, 4,432,319, Cl. 123-357.000.
Yasuhara, Seishi, 4,432,331, Cl. 123-571.000.
Nitrai, Jozsef: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.
Nitzberg, Leonard R. Wheel chair. 4,432,425, Cl. 180-8.00A.
Noble, Edward E. Lighted handgrip. 4,433,364, Cl. 362-109.000.
Noetzelmann, David C., Sr., to Midwec Toroid & Capacitor Corporation. Pressurizable telephone load coil assembly. 4,433,208, Cl. 178-46.000.
Noguchi, Toyota; Kaneko, Mamoru; and Katoh, Hironori, to Matsushita Electric Industrial Co., Ltd. Delta modulation system having reduced quantization noise. 4,433,311, Cl. 332-11.00D.
Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Three phase power factor controller. 4,433,276, Cl. 318-729.000.
Nolan, Thomas A., Jr.: *See*—
Gregory, William D.; Capots, Larry H.; Morelli, Luigi; Muhlke, John, III; and Nolan, Thomas A., Jr., 4,433,286, Cl. 324-61.00R.
Nolte, Kenneth G.: *See*—
Cox, Gordon F. N.; and Nolte, Kenneth G., 4,432,669, Cl. 405-217.000.
Nomura, Masami: *See*—
Caputo, William R.; and Nomura, Masami, 4,432,439, Cl. 187-29.00R.
Noon, Robert A.: *See*—
Kay, Ian T.; and Noon, Robert A., 4,432,784, Cl. 71-88.000.
Nordson Corporation: *See*—
Kolibas, James A., 4,433,296, Cl. 324-452.000.
Matt, Timothy S., 4,433,237, Cl. 250-222.100.
Norman, Deumite; Brannagan, James P.; and McLane, Wesley. Furnace brick tie back assembly. 4,432,289, Cl. 110-336.000.
Norman, George R. Process for treating used motor oil and synthetic crude oil. 4,432,865, Cl. 208-183.000.
Normandin, Michel. Physiotherapeutic self-exerciser. 4,432,543, Cl. 272-126.000.
Noro, Masao, to Nippon Gakki Seizo Kabushiki Kaisha. Power supply circuit for electrical apparatus. 4,433,369, Cl. 363-84.000.
Norris Industries, Inc.: *See*—
Ohannesian, Doru A.; and Walsh, Cyral M., 4,432,568, Cl. 285-3.000.
North American Philips Consumer Electronics Corp.: *See*—
Kuryla, Alan T.; Penird, Carl W.; and Puhak, Peter G., 4,433,267, Cl. 313-402.000.
Northern Solar Systems, Inc.: *See*—
Steele, Donald F., 4,432,409, Cl. 165-8.000.
Northern Telecom Limited: *See*—
Este, Grantley O., 4,433,386, Cl. 364-563.000.
Isaacs, Robert B., 4,433,216, Cl. 179-178.000.
Wei, John S. S., 4,432,611, Cl. 350-342.000.
Northrop Corporation: *See*—
Tong, Kay C., 4,432,511, Cl. 244-3.130.
Norvell, Gordon S.; and King, Donald W., to Litton Systems, Inc. Glass- or ceramic-to-metal seals. 4,432,660, Cl. 403-29.000.
Nosaka, Isao; Sakaguchi, Hirofumi; Shiozawa, Takao; and Fujii, Yozo, to Konishiroku Photo Industry Co., Ltd. Electrophotographic reproducing apparatus. 4,432,633, Cl. 355-8.000.
Noto, Akira: *See*—
Ogawa, Yasunao; Noto, Akira; Mori, Sachio; and Yoshioka, Mitsuru, 4,433,139, Cl. 536-17.200.
Noumi, Ryoichi: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.
Novoselac, John; and Churcher, Dale L., to Joy Manufacturing Company. Centrifuge apparatus and method of operating a centrifuge. 4,432,748, Cl. 494-2.000.
Novy, Robert A.: *See*—
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., 4,433,001, Cl. 426-614.000.
Nowogrodzki, Markus, to RCA Corporation. Wheel wear measurement system. 4,432,229, Cl. 73-146.000.
Nukem GmbH: *See*—
Ebinger, Horst; Kadner, Martin; and Luthardt, Guenther, 4,432,892, Cl. 252-628.000.
Henrich, Edmund; and Schlich, Elmar, 4,432,955, Cl. 423-249.000.
Nuutila, Antti I.; and Pohjola, Veikko J., to Oy Tampella AB. Method for continuous saccharification of cellulose of plant raw material. 4,432,805, Cl. 127-37.000.

Oak Industries Inc.: *See*—
Larson, Willis A.; and Van Zeeland, Anthony J., 4,433,223, Cl. 200-159.00B.
Obata, Haruyuki: *See*—
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.
Oberbach, Manfred: *See*—
Coordes, Heinz; and Oberbach, Manfred, 4,432,536, Cl. 266-280.000.
Occidental Chemical Corporation: *See*—
Gibby, William H., Jr., 4,433,101, Cl. 525-70.000.
Ocean Research Equipment, Inc.: *See*—
Lowell, Francis C.; and Campbell, Thomas K., 4,432,243, Cl. 73-861.310.
Ochsner, Arnold. Colored yarn printing apparatus. 4,432,217, Cl. 68-5.00D.
O'Connor, Richard P.: *See*—
Swart, Gerrit S.; Dauber, Louis S.; and O'Connor, Richard P., 4,432,862, Cl. 208-64.000.
Oda, Hiroyuki: *See*—
Morita, Yasuyuki; and Oda, Hiroyuki, 4,432,315, Cl. 123-310.000.
Oda, Kazutaka: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,432,854, Cl. 204-206.000.
Oda, Makoto: *See*—
Oishi, Tetsu; Oda, Makoto; and Futaki, Hisao, 4,432,211, Cl. 62-155.000.
Odake, Takaaki: *See*—
Tanaka, Ryohei; Kitamura, Akinobu; Odake, Takaaki; and Kato, Yutaka, 4,433,325, Cl. 340-937.000.
Officine Savio S.p.A.: *See*—
D'Agnolo, Armando, 4,432,198, Cl. 57-276.000.
Ogata, Hajime; Ichida, Toshio; Tsugawa, Shunichi; and Irie, Toshio, to Kawasaki Steel Corporation. Method of producing tin-free steel sheets having improved resistance to retorting treatment. 4,432,845, Cl. 204-56.00R.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Tape cassette. 4,432,510, Cl. 242-200.000.
Ogawa, Atsushi; and Hayashi, Yoshimasa, to Trio Kabushiki Kaisha. Sampling pulse forming circuit for FM stereo demodulator. 4,433,433, Cl. 381-7.000.
Ogawa, Hiroshi; Kimura, Syozi; and Miyawaki, Yoshinori, to Omron Tateisi Electronics Company. Electronic blood pressure measuring apparatus. 4,432,373, Cl. 128-680.000.
Ogawa, Kimio: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,432,510, Cl. 242-200.000.
Ogawa, Masaki; and Ikegami, Mikihiko, to Bridgestone Tire Company Limited. Pneumatic tires comprising an improved thread. 4,433,094, Cl. 524-496.000.
Ogawa, Masaki: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.
Ogawa, Masanobu; and Kojima, Toshitake, to Nippon Kayaku Kabushiki Kaisha. Process for the manufacture of methacrylic or acrylic acid. 4,433,167, Cl. 562-534.000.
Ogawa, Naoki, to Nissan Motor Company, Ltd. Noise reducing cover for internal combustion engine. 4,432,433, Cl. 181-204.000.
Ogawa, Soichiro, to Hitachi, Ltd. High-pressure discharge lamp. 4,433,272, Cl. 315-290.000.
Ogawa, Yasunao; Noto, Akira; Mori, Sachio; and Yoshioka, Mitsuru, to Shionogi & Co., Ltd. N-Acetyl-β-D-glucosamnides for determining N-acetyl-β-D-glucosaminidase activity. 4,433,139, Cl. 536-17.200.
Ogi, Keiji: *See*—
Itoh, Noboru; Takahashi, Toshiaki; Ogi, Keiji; and Kamitakahara, Atsushi, 4,433,049, Cl. 430-495.000.
Ogihara, Yutaka: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,433,255, Cl. 307-353.000.
Ogita, Tamotsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cold HC emission controlling device for automobile equipped with catalyst type disposal system. 4,432,316, Cl. 123-328.000.
Ogura, Shigeru: *See*—
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.
Ohannesian, Doru A.; and Walsh, Cyral M., to Norris Industries, Inc. Housing for garbage disposer. 4,432,568, Cl. 285-3.000.
Ohara, Osamu: *See*—
Narukawa, Hiroshi; Tada, Rentaro; Takeuchi, Yasuhira; and Ohara, Osamu, 4,433,020, Cl. 428-113.000.
Ohhori, Harumi: *See*—
Andoh, Masamoto; Ohhori, Harumi; and Kiriyama, Takashi, 4,432,586, Cl. 303-115.000.
Ohkawa, Shuji: *See*—
Tachikawa, Hajime; and Ohkawa, Shuji, 4,433,232, Cl. 219-502.000.
Ohmori, Tsuguharu; and Ueno, Sadaumi, to Fuji Electric Company, Ltd. Pressure pouring furnace. 4,432,535, Cl. 266-239.000.
Ohshima, Yoshimasa: *See*—
Akiyama, Nobuyuki; Ohshima, Yoshimasa; and Koizumi, Mitsuyoshi, 4,433,235, Cl. 250-201.000.
Ohta, Kazutoshi; and Sakakibara, Kunio, to Mitsubishi Denki Kabushiki Kaisha. Panel for elevator. 4,433,023, Cl. 428-182.000.
Ohtake, Yoshichi, to Victor Company of Japan, Limited. Single-lens reflex type viewfinder and method of adjusting the same. 4,432,626, Cl. 354-155.000.
Ohuchi, Yutaka: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.
Oishi, Tetsu; Oda, Makoto; and Futaki, Hisao, to Hitachi, Ltd. Defrosting apparatus. 4,432,211, Cl. 62-155.000.
Okabe, Takahiro: *See*—
Kaneko, Kenji; Okabe, Takahiro; Nagata, Minoru; and Okada, Yutaka, 4,433,258, Cl. 307-456.000.
Okada, Kiyomi, to San Energy Co., Ltd. Combustion apparatus for granular solid fuel. 4,432,288, Cl. 110-266.000.
Okada Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio, 4,432,137, Cl. 30-292.000.
Okada, Osami: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Okada, Yoshio, to Okada Kogyo Kabushiki Kaisha. Rotary cutter. 4,432,137, Cl. 30-292.000.
Okada, Yutaka: *See*—
Kaneko, Kenji; Okabe, Takahiro; Nagata, Minoru; and Okada, Yutaka, 4,433,258, Cl. 307-456.000.
Okamoto, Haruo; and Yamada, Motoyuki, to Shin-Etsu Chemical Co., Ltd. Method for manufacturing fused quartz glass. 4,432,781, Cl. 65-18.200.
Okamoto, Ikuzo: *See*—
Itoh, Kiyoshi; Nishikawa, Yukiyasu; Hoshika, Shuji; and Okamoto, Ikuzo, 4,432,617, Cl. 351-211.000.
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Adhesive compositions. 4,433,124, Cl. 526-277.000.
Okamura, Toshihiko, to Sony Corporation. Electric rotating machine. 4,433,259, Cl. 310-89.000.
Okano, Kinpei: *See*—
Nii, Katsutoshi; Okano, Kinpei; Doi, Motomichi; and Kitsuya, Minoru, 4,433,432, Cl. 378-193.000.
Okano, Reijiro; and Usami, Kiyoshi, to Nippondenso Co., Ltd. Electromagnetic coupling apparatus. 4,432,446, Cl. 192-84.00C.
O'Keefe, David B.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.
Okudaira, Sadayuki: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Okura Kogyo Kabushiki Kaisha: *See*—
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,433,124, Cl. 526-277.000.
Okuyama, Nobutaka; Shimizu, Toshiharu; and Naito, Yoshikazu, to Hitachi, Ltd. Deflection yoke for a picture tube of a projection color television receiver set. 4,433,318, Cl. 335-213.000.
Olah, George A. Condensation of natural gas or methane into gasoline range hydrocarbons. 4,433,192, Cl. 585-709.000.
Olin Corporation: *See*—
Adams, John O., 4,432,240, Cl. 73-822.000.
Kadija, Igor V., 4,432,838, Cl. 204-11.000.
Olin, Lester D.: *See*—
Morency, Roger L.; and Olin, Lester D., 4,432,603, Cl. 350-96.210.
Ollinger, James C.: *See*—
Addie, Lee W.; and Ollinger, James C., 4,432,182, Cl. 52-480.000.
Olson, Dean R.: *See*—
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., 4,433,016, Cl. 428-34.000.
Olympus Optical Co., Ltd.: *See*—
Kimura, Kenji, 4,433,349, Cl. 360-66.000.
Mizokami, Kazunori, 4,432,627, Cl. 354-289.100.
Nagasaki, Tatsuo, 4,432,236, Cl. 73-631.000.
Nishikawa, Masaji, 4,433,038, Cl. 430-55.000.
Yamasaki, Masafumi; and Yoshida, Muneaki, 4,432,623, Cl. 354-412.000.
Omark Industries, Inc.: *See*—
Scott, Lewis A., 4,432,264, Cl. 83-835.000.
OMI International Corporation: *See*—
Tremmel, Robert A., 4,432,843, Cl. 204-51.000.
Omoda, Koichiro: *See*—
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,433,394, Cl. 365-221.000.
Omron Tateisi Electronics Company: *See*—
Ogawa, Hiroshi; Kimura, Syozi; and Miyawaki, Yoshinori, 4,432,373, Cl. 128-680.000.
Tanaka, Ryohei; Kitamura, Akinobu; Odake, Takaaki; and Kato, Yutaka, 4,433,325, Cl. 340-937.000.
Onuki, Osamu; and Kirisawa, Toyohiko, to Doryokuro Kakunenryo Kaihatsu, Jigyodan. Cold trap. 4,432,208, Cl. 62-55.500.
Ookouchi, Motomi: *See*—
Katakura, Masayuki; Akagiri, Kenzo; and Ookouchi, Motomi, 4,433,254, Cl. 307-350.000.
Oosterbaan, DuWayne D., to NCR Corporation. Longitudinal parity. 4,433,388, Cl. 364-900.000.

Original Hanau Heraeus GmbH: *See*—
Fischer, Helmut; Schafer, Jurgen; and Thomas, Gunter, 4,433,265, Cl. 313-22.000.
Oritani, Atsushi, to Fujitsu Limited. Semiconductor memory device. 4,433,393, Cl. 365-203.000.
Orlando, Franklin P., to FMC Corporation. Continuous harvester for plants grown in rows. 4,432,190, Cl. 56-1.000.
Ortho Diagnostic Systems Inc.: *See*—
Chang, Chi-Deu; and Graham, Henry A., Jr., 4,433,059, Cl. 436-512.000.
Osanai, Hiroshi. Plethysmographic acceleration pulse wave meter. 4,432,374, Cl. 128-694.000.
Oscarsson, Rolf A. Attachment device for medical fluids bag. 4,432,765, Cl. 604-411.000.
Oshiro, Susumu, to Fuji Photo Optical Co., Ltd. Articulated tube structure for use in an endoscope. 4,432,349, Cl. 128-4.000.
Ostermeyer, Larry F.; and Guerin, Michael N., to K. E. McConaughay, Inc. High-float, rapid-setting emulsion. 4,433,084, Cl. 524-62.000.
Osterwald, Hermann: *See*—
Bauer, Kurt H.; Osterwald, Hermann; Lehmann, Klaus; and Dreher, Dieter, 4,433,076, Cl. 523-342.000.
Ostrowski, Carl L.; and White, Bertram, to Federal Screw Works. Integrated circuit phoneme-based speech synthesizer. 4,433,210, Cl. 381-53.000.
Otis Engineering Corporation: *See*—
Welch, William R.; Fisher, Ernest P.; and Yonker, John H., 4,432,416, Cl. 166-117.500.
Otsu, Hirosho: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.
Otsuka, Kazutoshi, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation system having electrical control means. 4,432,330, Cl. 123-571.000.
Otsuki, Hiromi: *See*—
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.
Ott, Helmut, to Herion-Werke KG. Impulse valve. 4,432,391, Cl. 137-625.640.
Otte, Richard F.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.
Otto Engineering, Inc.: *See*—
Sopha, Timothy J., 4,432,470, Cl. 222-135.000.
Outboard Marine Corporation: *See*—
Bland, Gerald F.; and Sullivan, Donald K., 4,432,734, Cl. 440-1.000.
Ovadia, Abraham: *See*—
Ovadia, Joseph; and Ovadia, Abraham, 4,432,456, Cl. 206-566.000.
Ovadia, Joseph; and Ovadia, Abraham. Jewelry display and storage apparatus. 4,432,456, Cl. 206-566.000.
Overholt, Mark. Direct drive dual drum winch. 4,432,532, Cl. 254-291.000.
Ovren, Christer: *See*—
Adolfsson, Morgan; Brogardh, Torgny; Goransson, Sture; and Ovren, Christer, 4,433,238, Cl. 250-227.000.
Owatonna Manufacturing Company, Inc.: *See*—
Henkensiefken, Larry L.; Pettit, Douglas L.; and Barry, Gerald E., 4,432,499, Cl. 241-30.000.
Owen, Ieuan: *See*—
Parkinson, Michael J.; Jury, Anthony W.; Syred, Nicholas; and Owen, Ieuan, 4,432,778, Cl. 55-212.000.
Owens-Corning Fiberglas Corporation: *See*—
Dunn, Charles S., 4,433,420, Cl. 373-39.000.
Propster, Mark A.; Hohman, Charles M.; and Streicher, William L., 4,432,780, Cl. 65-2.000.
Williamson, Michael, 4,433,419, Cl. 373-37.000.
Owens-Illinois, Inc.: *See*—
Miller, Peter S., 4,432,481, Cl. 226-9.000.
Mumford, George V.; and Li, Ernest L., 4,432,461, Cl. 215-252.000.
Oy Tampella AB: *See*—
Nuuttila, Antti I.; and Pohjola, Veikko J., 4,432,805, Cl. 127-37.000.
Oya, Akiyoshi; and Sekiguchi, Tomoaki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument controlling tone properties by control data signals. 4,432,265, Cl. 84-1.010.
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, to Pioneer Electronic Corporation. Amplifier circuit. 4,433,305, Cl. 330-296.000.
Ozen Corporation: *See*—
Watanabe, Katsumi, 4,433,404, Cl. 369-66.000.
Pace, Ron L. Holder and dispenser for bathroom tissue rolls. 4,432,504, Cl. 242-55.200.
Pacht, Amos, to Butterworth, Inc. Valve assembly for reciprocating plunger pump. 4,432,386, Cl. 137-327.000.
Padanyi, Sandor Z. M.: *See*—
Barnard, John; and Padanyi, Sandor Z. M., 4,432,928, Cl. 264-519.000.
Padberg, Gunter: *See*—
Kupper, Friedrich-Wilhelm; Padberg, Gunter; Reichert, Ulrich; and Trautmann, Walter, 4,433,099, Cl. 525-53.000.
Page, Judith L.; Haigh, Daniel H.; and Peters, James, to Dow Chemical Company, The. Weight control with fat imbibing polymers. 4,432,968, Cl. 424-81.000.
Paisley, Robert J., to Corning Glass Works. Methods for fabricating selectively plugged honeycomb structures. 4,432,918, Cl. 264-43.000.
Pako Corporation: *See*—
Caflisch, Jerry A., 4,432,629, Cl. 354-299.000.
Lee, Conrad E.; and Caflisch, Jerry A., 4,432,475, Cl. 222-509.000.
Paley, Hyman W. Plastic manifold assembly. 4,432,392, Cl. 137-883.000.
Palm, Charles S., to Datapoint Corporation. Calibrated apparent surface voltage measurement apparatus and method. 4,433,298, Cl. 324-457.000.
Palmer, Bryan H.: *See*—
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.
Palmer, James L.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Palmer, John P.; and Blackburn, Neil P., to ITW Limited. Threaded members. 4,432,684, Cl. 411-366.000.
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., to United States of America, Army. Footwear testing apparatus and method. 4,432,223, Cl. 73-7.000.
Park-Ohio Industries, Inc.: *See*—
Wagar, Richard L., 4,433,226, Cl. 219-10.410.
Parker Chemical Company: *See*—
Lindert, Andreas, 4,433,015, Cl. 427-388.400.
Parker, John A.: *See*—
Varma, Indra K.; Fohlen, George M.; and Parker, John A., 4,433,115, Cl. 525-417.000.
Parker, Robert R.; and Starai, Rudolph, to Bell & Howell Company. Tray drive and slide change control apparatus for slide projector. 4,432,618, Cl. 353-25.000.
Parkinson, Michael J.; Jury, Anthony W.; Syred, Nicholas; and Owen, Ieuan, to Coal Industry (Patents) Limited. Fluidic switched fluid cleaning. 4,432,778, Cl. 55-212.000.
Parramore, Thomas S., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Water-jet steering mechanisms. 4,432,736, Cl. 440-42.000.
Paschke, Edward E.: *See*—
Schwartz, Michael M.; Knox, Jack R.; and Paschke, Edward E., 4,433,118, Cl. 525-437.000.
Pascoe, William E.: *See*—
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,433,130, Cl. 528-173.000.
Patel, Ravin: *See*—
Arens, Egidius; and Patel, Ravin, 4,433,397, Cl. 367-122.000.
Patel, Vipin N.; and Conarroe, John L., Jr., to Harris Corporation. Amorphous switching device with residual crystallization retardation. 4,433,342, Cl. 357-2.000.
Patrick, James F. Single wheel golf caddy. 4,432,560, Cl. 280-47.190.
Patterson, Donald J.: *See*—
Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., 4,432,344, Cl. 126-438.000.
Paulik, Frank E.: *See*—
Singleton, Thomas C.; and Paulik, Frank E., 4,433,166, Cl. 562-519.000.
Pawlosk, Chester E., to Dow Chemical Co., The. Heterocyclic substituted triazol-3-ol compounds. 4,433,148, Cl. 544-322.000.
Paxall, Inc.: *See*—
Eldridge, Charles W., 4,432,745, Cl. 493-10.000.
Paxton, Ronald E.: *See*—
Larson, Douglas A.; Tacke, Kenneth L.; White, Craig A.; and Paxton, Ronald E., 4,433,011, Cl. 427-231.000.
Pearson, Richard K.: *See*—
McGuire, Raymond P.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,432,902, Cl. 260-239.0HM.
Pearson, Stephen, to Baxter Travenol Laboratories, Inc. Sterile coupling. 4,432,755, Cl. 604-56.000.
Pechacek, Raymond E.; and Clay, Eugene J., to Hahn & Clay. Method and system for installing a layered vessel on location. 4,432,128, Cl. 29-429.000.
Pedain, Josef; Wellner, Wolfgang; Konig, Klaus; and Gruber, Hermann, to Bayer Aktiengesellschaft. Process for preparing glass constructions. 4,433,010, Cl. 427-160.000.
Peer, Herbert R., to Transagra Corporation. Preparation of bacteria cultures tolerant to metal ions. 4,432,998, Cl. 426-43.000.
Pelekis, Emmanouil A., to General Supply (Construction) Co., Ltd. Internal combustion engine. 4,432,314, Cl. 123-238.000.
Penird, Carl W.: *See*—
Kuryla, Alan T.; Penird, Carl W.; and Puhak, Peter G., 4,433,267, Cl. 313-402.000.
Pennanen, Hannu K.: *See*—
Gaske, Joseph E.; and Pennanen, Hannu K., 4,433,014, Cl. 427-380.000.
Perkin-Elmer Corporation, The: *See*—
Poultney, Sherman K., 4,433,245, Cl. 250-458.100.
Perkins, William C., to Rockwell International Corporation. Power line communications bypass around delta-wye transformer. 4,433,284, Cl. 323-361.000.
Perlick, Mark A.: *See*—
Borman, August H.; and Perlick, Mark A., 4,432,255, Cl. 74-869.000.
Permacel: *See*—
Korpman, Ralf, 4,432,848, Cl. 204-159.170.

Perrin, Claude: *See*—
Dumaitre, Bernard; Perrin, Claude; Cornu, Pierre-Jean; and Streichenberger, Gilles, 4,432,984, Cl. 424-267.000.
Peters, James: *See*—
Page, Judith L.; Haigh, Daniel H.; and Peters, James, 4,432,968, Cl. 424-81.000.
Peters, James B.: *See*—
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.
Petersen, Christian C., to Polaroid Corporation. Camera motor belt drive system. 4,433,273, Cl. 318-135.000.
Petiot, Jean P., to Automobiles Citroen. Universal joints and a holding clip for such joints. 4,432,740, Cl. 464-146.000.
Petrillo, Edward W., Jr.: *See*—
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,432,971, Cl. 424-177.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,432,972, Cl. 424-177.000.
Petro-Canada Exploration Inc.: *See*—
Thompson, Gordon R., 4,433,239, Cl. 250-255.000.
Petrzilka, Martin; and Schleich, Kuno, to Hoffmann-La Roche Inc. Decalins. 4,432,885, Cl. 252-299.610.
Pettit, Douglas L.: *See*—
Henkensiefken, Larry L.; Pettit, Douglas L.; and Barry, Gerald E., 4,432,499, Cl. 241-30.000.
Pfaff Haushalmaschinen GmbH: *See*—
Kemmel, Patrice J., 4,432,297, Cl. 112-278.000.
Pfahler, Gerhard: *See*—
Wiezer, Hartmut; and Pfahler, Gerhard, 4,433,145, Cl. 544-198.000.
Pfeifer, Josef, to Ciba-Geigy Corporation. Transparent polyamide from branched chain arylene diamine. 4,433,137, Cl. 528-348.000.
Pfeiler, Manfred, to Siemens Aktiengesellschaft. Rotating anode x-ray tube. 4,433,431, Cl. 378-157.000.
Pfizer Inc.: *See*—
Barth, Wayne E.; and Jasys, Vytautas J., 4,432,987, Cl. 424-271.000.
Bigham, Eric C., 4,432,903, Cl. 260-239.100.
Kellogg, Michael S., 4,432,970, Cl. 424-114.000.
Welch, Willard M.; and Harbert, Charles A., 4,432,978, Cl. 424-249.000.
Phalippou, Jean E. H.: *See*—
Zarzycki, Jerzy W.; Prassas, Michel; and Phalippou, Jean E. H., 4,432,956, Cl. 423-338.000.
Pharmindustrie: *See*—
Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., 4,433,150, Cl. 546-168.000.
Philips Medical Systems, Inc.: *See*—
Abele, Manlio G.; and Marshall, Christopher H., 4,433,380, Cl. 564-414.000.
Phillips, Martha E.; and Woerner, Leo G. Geodesic dome connector. 4,432,661, Cl. 403-172.000.
Phillips Petroleum Company: *See*—
Louthan, Rector P., 4,433,134, Cl. 528-279.000.
Smith, Sanford N., 4,432,867, Cl. 209-140.000.
Picart, Francois, to Societe de Recherches Industrielles (S.O.R.I.). Benzoyl- and α-hydroxybenzyl-phenyl-glycosides and application thereof in therapeutics. 4,432,973, Cl. 424-180.000.
Piccolo, Albert V., Jr. Cutting blade. 4,432,138, Cl. 30-294.000.
Piesinger, Gregory H. Electrocardiograph receiver. 4,432,367, Cl. 128-639.000.
Piggin, Roger H.: *See*—
Solberg, John C.; Piggin, Roger H.; and Wilgus, Herbert S., 4,433,048, Cl. 430-434.000.
Pignon, Thomas E., to Johnson Matthey Public Limited Company. Method for imparting resistance to axial displacement of convolutions in a convoluted catalyst substrate. 4,433,064, Cl. 502-527.000.
Pike, Robert D.; and Bobolts, Elroy F., to Gory Associated Industries, Inc. Roofing tile. 4,432,183, Cl. 52-533.000.
Pilkington P.E. Limited: *See*—
Campbell, Duncan R. J.; and Rogers, Philip J., 4,432,596, Cl. 350-1.300.
Pioneer Electronic Corporation: *See*—
Hirata, Hitoshi, 4,433,308, Cl. 331-17.000.
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.
Sasaki, Katuhiro, 4,433,303, Cl. 330-264.000.
Pipkorn, Mark G.: *See*—
Stevenson, Joan M.; and Pipkorn, Mark G., 4,432,624, Cl. 354-238.100.
Pitcher, Laurence S. Hitching guidance device. 4,432,563, Cl. 280-477.000.
Pitoiset, Didier, to Valeo. Variable speed drive pulley. 4,432,743, Cl. 474-14.000.
Pitroda, Pravin G. Shower device. 4,432,105, Cl. 4-597.000.
Pizzarello, Frank A.: *See*—
Nicholson, Margie M.; and Pizzarello, Frank A., 4,432,612, Cl. 350-357.000.
Plekenpol, David D.: *See*—
Manschot, James G.; Salvadori, Lawrence A.; and Plekenpol, David D., 4,432,763, Cl. 604-262.000.
Plessey Overseas Limited: *See*—
Johnson, Phillip L. M.; and Walden, John R., 4,433,396, Cl. 367-105.000.
Pletsch, Hubert, to Carl Freudenberg, Firma. Hydraulic support. 4,432,537, Cl. 267-8.00R.
Plummer, Ernest L., to FMC Corporation. Insecticidal 2,2'-bridged[1,1'-biphenyl]-3-ylmethyl esters. 4,433,182, Cl. 568-808.000.
Pociluyko, Alex, to Scott Paper Company. Cationic dyestuff printing inks. 4,432,900, Cl. 260-160.000.
Pohjola, Veikko J.: *See*—
Nuuttila, Antti I.; and Pohjola, Veikko J., 4,432,805, Cl. 127-37.000.
Polaroid Corporation: *See*—
Fantone, Stephen D., 4,432,832, Cl. 156-630.000.
Fantone, Stephen D., 4,433,437, Cl. 382-31.000.
Manning, Monis J., 4,432,595, Cl. 350-1.100.
Petersen, Christian C., 4,433,273, Cl. 318-135.000.
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,433,132, Cl. 528-191.000.
Polos, Constantine D. Toggle bolt assembly. 4,432,683, Cl. 411-340.000.
Polysar Limited: *See*—
Callander, Keith A., 4,433,077, Cl. 523-344.000.
Pomeranz, Mark L. Condom with rheopexic filled deformable chamber. 4,432,357, Cl. 128-79.000.
Posey, Franz A.: *See*—
Hurst, Fred J.; Brown, Gilbert M.; and Posey, Franz A., 4,432,945, Cl. 423-10.000.
Posse, Gunther; and Jacob, Horst, to Klockner-Humboldt-Deutz AG. Centrifugal separator control. 4,432,747, Cl. 494-8.000.
Postma, Arlin K., to United States of America, Energy. Method for removing particulate matter from a gas stream. 4,432,777, Cl. 55-86.000.
Potash, Hanan, to Burroughs Corporation. Buffered handshake bus with transmission and response counters for avoiding receiver overflow. 4,433,391, Cl. 364-900.000.
Poulsen, Peter, to Aktieselskabet Den kongelige Porcelainsfabrik. Paint medium for applying overglaze decoration to porcelain and an overglaze paint on basis of this medium. 4,433,091, Cl. 524-386.000.
Poultney, Sherman K., to Perkin-Elmer Corporation, The. Fraunhofer line discriminator. 4,433,245, Cl. 250-458.100.
Poynter, Donald B., to Poynter Products, Inc. Joke cigarette lighter. 4,432,542, Cl. 272-27.00W.
Poynter Products, Inc.: *See*—
Poynter, Donald B., 4,432,542, Cl. 272-27.00W.
PPG Industries, Inc.: *See*—
Moriarity, Thomas C.; and Geiger, William J., 4,432,850, Cl. 204-181.00C.
Neely, James E., Jr.; Lin, Chia-Cheng; Olson, Dean R.; Jacobson, Annette M.; and Falleroni, Charlene A., 4,433,016, Cl. 428-34.000.
Seymour, Samuel L., 4,432,782, Cl. 65-25.200.
Prassas, Michel: *See*—
Zarzycki, Jerzy W.; Prassas, Michel; and Phalippou, Jean E. H., 4,432,956, Cl. 423-338.000.
Preuss, Wolfgang: *See*—
Bahn, Michael; Preuss, Wolfgang; Schmid, Rolf; and Wagner, Rudiger, 4,432,905, Cl. 260-397.100.
Price, Elvin C.; and Dasher, Preston B., to Atlanta Attachment Company. Garment forming method and apparatus. 4,432,294, Cl. 112-262.300.
Pro-Pattern, Inc.: *See*—
Zebelean, John, 4,432,549, Cl. 273-167.00H.
Procter & Gamble Company, The: *See*—
DeHaan, Dennis A., 4,432,746, Cl. 493-359.000.
Proctor, Paul W.: *See*—
Kennedy, Katherine L.; Proctor, Paul W.; and Dow, Robert L., 4,432,816, Cl. 149-19.300.
Propster, Mark A.; Hohman, Charles M.; and Streicher, William L., to Owens-Corning Fiberglas Corporation. Glass fiber scrap reclamation. 4,432,780, Cl. 65-2.000.
Protectaire Systems Company: *See*—
Russell, Frederick E., 4,432,870, Cl. 210-143.000.
Provencher, Amede R., to Kidde, Inc. Electrical instrument with removable calibrating knob. 4,433,218, Cl. 200-11.00R.
Pruente, Thomas F.; and Tamargo, Anna, to St. Joseph Mercy Hospital Pontiac. Portable telephone support. 4,432,522, Cl. 248-215.000.
Puhak, Peter G.: *See*—
Kuryla, Alan T.; Penird, Carl W.; and Puhak, Peter G., 4,433,267, Cl. 313-402.000.
Puhringer, Josef A., to Dynamit Nobel Aktiengesellschaft. Process for imparting hydrophobicity to mineral substrates. 4,433,013, Cl. 427-337.000.
Pusch, Gunter; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner. Heat reflecting wall or ceiling covering. 4,433,025, Cl. 428-207.000.
Pusch, Klaus-Werner: *See*—
Pusch, Gunter; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,433,025, Cl. 428-207.000.
Pusineri, Christian; and Goletto, Jean, to Hospal-Sodip, S.A. Mixtures of polymers for medical use. 4,433,072, Cl. 523-105.000.
Quaintance, Roger L.: *See*—
Jacobson, Wayne M.; and Quaintance, Roger L., 4,432,676, Cl. 406-39.000.
Quante, Heinrich, to Quante, Heinrich. Production of gypsum hemihydrate with waste heat, aqueous H_2SO_4 and sulfuric acid salts. 4,432,954, Cl. 423-171.000.
Quattlander, Rolf: *See*—
Ruf, Hans R.; Quattlander, Rolf; Reichlin, Max; and Hilpert, Patrik, 4,432,380, Cl. 134-104.000.
Queen's University at Kingston: *See*—
Stevenson, Joan M.; and Pipkorn, Mark G., 4,432,624, Cl. 354-238.100.

Racciu, Antonio: *See*—
De Gasperi, Mario M.; Racciu, Antonio; and Nari, Dario, 4,433,385, Cl. 364-554.000.
Radomski, Thomas A.: *See*—
Karadsheh, Sam M.; and Radomski, Thomas A., 4,433,370, Cl. 363-124.000.
Raisin, Jean-Pierre; Helffer, Bernard; and Chirouze, Jean L., to Institut Textile de France; Agence Nationale de Valorisation de la Recherche (ANVAR); and Meca. Processing method and apparatus for rectangular pieces of fabric. 4,432,295, Cl. 112-262.300.
Rampe, John F., to Rampe Research. Finishing apparatus with improved discharge door structure. 4,432,168, Cl. 51-163.100.
Rampe Research: *See*—
Rampe, John F., 4,432,168, Cl. 51-163.100.
Rank, Werner, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Foot joint for connecting a movable service tower of an off-shore station to a foundation. 4,432,668, Cl. 405-202.000.
Rasmussen, Robert. Hydraulic chuck having ring collet. 4,432,559, Cl. 279-4.000.
Rastl, Eva: *See*—
Seliger, Hartmut; Rastl, Eva; and Swetly, Peter, 4,433,140, Cl. 536-27.000.
Rathmayr, Heinz: *See*—
Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, 4,432,320, Cl. 123-357.000.
Raudat, John L., to Standard-Knapp, Inc. Shifting grid style packer with lane holdback. 4,432,189, Cl. 53-497.000.
Rawls, H. Ralph: *See*—
Gettleman, Lawrence; Farris, Charles L.; Rawls, H. Ralph; and LeBouef, Ralph J., Jr., 4,432,730, Cl. 433-168.000.
Rayburn, Joseph W., to Arinc Research Corp. Integrated tube socket assembly. 4,433,285, Cl. 323-364.000.
Raychem Corporation: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.
Raynolds, Stuart; and Fournier, Louis B., to Du Pont de Nemours, E. I., and Company. Hydrocarbon foams. 4,432,882, Cl. 252-8.55R.
Raytheon Company: *See*—
Smith, Irl W., 4,433,418, Cl. 372-95.000.
RCA Corporation: *See*—
Caprari, Fausto; and Geshner, Robert A., 4,432,641, Cl. 356-237.000.
Meyer, Wolfgang H.; and Curtis, Bernard J., 4,433,044, Cl. 430-271.000.
Moore, Arnold R., 4,433,288, Cl. 324-158.00D.
Nowogrodzki, Markus, 4,432,229, Cl. 73-146.000.
Riddle, George H. N., 4,433,407, Cl. 369-127.000.
Schnable, George L.; and James, Edward A., 4,433,008, Cl. 427-85.000.
Siryj, Bohdan W.; and Lazzery, Angelo G., 4,433,410, Cl. 369-291.000.
Read, Wayne L.: *See*—
Westerlund, Robert E.; and Read, Wayne L., 4,432,558, Cl. 277-180.000.
Redele, Jean E. A., to Scoma Energie. Apparatus for heating fuel injected into a diesel engine. 4,432,329, Cl. 123-557.000.
Reed, Michael A.: *See*—
Saphir, Marc E.; and Reed, Michael A., 4,433,328, Cl. 340-555.000.
Reedy, James D.: *See*—
Yang, Kang; and Reedy, James D., 4,433,196, Cl. 585-823.000.
Reeves, Michael K.: *See*—
Clark, James R.; and Reeves, Michael K., 4,432,404, Cl. 145-2.00R.
Rehwald, Willi: *See*—
Besemann, Alfred; and Rehwald, Willi, 4,432,262, Cl. 83-311.000.
Reichenberger, Jurgen: *See*—
Juntgen, Harald; Knoblauch, Karl; Reichenberger, Jurgen; and Schroter, Hans-Jurgen, 4,432,774, Cl. 55-25.000.
Reichert, Ulrich: *See*—
Kupper, Friedrich-Wilhelm; Padberg, Gunter; Reichert, Ulrich; and Trautmann, Walter, 4,433,099, Cl. 525-53.000.
Reichlin, Max: *See*—
Ruf, Hans R.; Quattlander, Rolf; Reichlin, Max; and Hilpert, Patrik, 4,432,380, Cl. 134-104.000.
Reiff, Helmut: *See*—
Hombach, Rudolf; Reiff, Helmut; Wenzel, Wolfgang; and Dollhausen, Manfred, 4,433,095, Cl. 524-563.000.
Reimerdes, Ernst H., to Dr. Otto Suwelack NACHF. GmbH & Co. Process for producing aroma-containing food products. 4,432,997, Cl. 426-7.000.
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., to Bayer Aktiengesellschaft. Process for the production of dry-spun hollow polyacrylonitrile fibers and filaments. 4,432,923, Cl. 264-206.000.
Reinhardt, Juergen: *See*—
Finkenzeller, Johann; and Reinhardt, Juergen, 4,433,429, Cl. 378-99.000.
Reittu, Osmo: *See*—
Varkia, Esa; and Reittu, Osmo, 4,432,502, Cl. 242-50.000.
Renault, Christian L. A.: *See*—
Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., 4,433,150, Cl. 546-168.000.
Renzel, Peter; and Jacobs, Hanno, to Krautkramer-Branson, Inc. Ultrasonic instrument with time and amplitude gate bar display. 4,432,235, Cl. 73-611.000.
Research Corporation: *See*—
Riley, Thomas N.; and Bagley, Jerry, 4,432,983, Cl. 424-265.000.
Resistic Materials Inc.: *See*—
Denzine, Allen F.; and Thurber, William E. F., Jr., 4,432,883, Cl. 252-12.000.
Resnick, Brian J.: *See*—
Cunningham, Carole S.; Linser, Charles M.; Resnick, Brian J.; and Tarvin, Ronald L., 4,433,382, Cl. 364-474.000.
Rest, Jerome. Device for preventing sewage backup in drain lines. 4,432,388, Cl. 137-403.000.
Restaurant Technology, Inc.: *See*—
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., 4,433,001, Cl. 426-614.000.
Revere Products Corporation: *See*—
Devitt, Gerald J., 4,432,273, Cl. 98-43.00C.
Reynolds Metals Company: *See*—
Swendeman, Jim M., 4,432,279, Cl. 100-171.000.
Rhodes, John H., Jr.: *See*—
Clark, William D.; Garner, Mark D.; Rhodes, John H., Jr.; and Wilzbach, Bernard L., 4,432,541, Cl. 271-251.000.
Rhone-Poulenc Industries: *See*—
Jenck, Jean, 4,433,164, Cl. 560-207.000.
Rhone-Poulenc S.A.: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,433,171, Cl. 568-33.000.
Rice, Doris M.; and Dominguez, Richard J. G., to Texaco Inc. Reaction injection molded elastomers prepared from amine terminated polyethers, amine terminated chain extender and aromatic polyisocyanate. 4,433,067, Cl. 521-51.000.
Rice, Stuart L., to Caterpillar Tractor Co. Drive train gear of lower bainite alloy steel. 4,432,812, Cl. 148-36.000.
Richard, Daniel: *See*—
Zanetta, Hugues; and Richard, Daniel, 4,432,534, Cl. 266-225.000.
Richard S. Talbot and Associates: *See*—
Talbot, Richard S., 4,432,880, Cl. 210-725.000.
Richards, Malcolm E., to Mafix, Incorporated. Inflatable ball repair. 4,432,547, Cl. 273-65.00R.
Richardson, Kenneth R.: *See*—
Hughes, Lorenzo; and Richardson, Kenneth R., 4,433,053, Cl. 435-141.000.
Richardson, Michael A., to Marcon International Limited. Insulation of tunnel linings. 4,432,667, Cl. 405-143.000.
Richelli, Angelo; and Battistella, Guido, to Samifi Babcock Samifi Internationale S.A. Device for insertion and feed of products on the plates in a horizontal plate freezer. 4,432,214, Cl. 62-341.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.
Richter, Johan C. F. C.: *See*—
Sherman, Michael I.; and Richter, Johan C. F. C., 4,432,836, Cl. 162-237.000.
Ricoh Company, Ltd.: *See*—
Kawashima, Ikue; Fukushima, Yoshio; Murano, Tamio; and Suzuki, Toshitatsu, 4,432,622, Cl. 354-408.000.
Kurokawa, Hiroshi, 4,432,620, Cl. 354-402.000.
Yokota, Takashi, 4,432,632, Cl. 355-3.0DD.
Riddle, George H. N., to RCA Corporation. Method and apparatus for recording video signals into a metal substrate. 4,433,407, Cl. 369-127.000.
Riehl, Fred, to Robert Shaw Controls Company. Electrical ignition probe means and method of making the same. 4,433,266, Cl. 313-135.000.
Riel, Frank J., to Rohr Industries, Inc. Sound attenuation sandwich panel including barrier material for corrosion control. 4,433,021, Cl. 428-116.000.
Riessberger, Klaus: *See*—
Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, 4,432,284, Cl. 104-7.00R.
Rieter Machine Works Limited: *See*—
Bischofberger, Jurg; and Stalder, Herbert, 4,432,200, Cl. 57-304.000.
Rietsch, Maurice; and Joly, Jean, to Aciers et Outillage Peugeot. Retractor for a safety strap. 4,432,507, Cl. 242-107.40A.
Riise, H. Norman; Goranson, George G.; and Karwan, Henry P., to Viking Solar Systems, Incorporated. Solar energy collector system. 4,432,343, Cl. 126-424.000.
Riken Denshi Co., Ltd.: *See*—
Morita, Akiro; and Watanabe, Isamu, 4,433,287, Cl. 324-115.000.
Riker Laboratories, Inc.: *See*—
Erickson, Edward H., 4,432,986, Cl. 424-269.000.
Riley, Thomas N.; and Bagley, Jerry, to Research Corporation. Conformationally restricted histamine H_2-receptor antagonists containing a tropane ring. 4,432,983, Cl. 424-265.000.
Rinehart, John R. Method of making a composite foam taxidermy mannikin. 4,432,919, Cl. 264-46.400.
Rinkewich, Isaac, to M.I.T. Poly-Cart Corp. Storage and transport cart with improved security. 4,432,591, Cl. 312-297.000.
Ripamonti, Paolo, to ANSALDO S.p.A. Circuit for detecting unbalance of the traction current in a track circuit. 4,432,517, Cl. 246-28.00F.

Risdon Enterprises, Inc.: *See*—
Meetze, Murray O., Jr., 4,432,938, Cl. 422-49.000.
Rivercross Learning Corp.: *See*—
Carlson, Albert W. D., 4,432,733, Cl. 434-339.000.
Roag: *See*—
Ruf, Hans R.; Quattlander, Rolf; Reichlin, Max; and Hilpert, Patrik, 4,432,380, Cl. 134-104.000.
Robert Bosch GmbH: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Kuschmierz, Heinz; and Vogel, Wilhelm, 4,432,228, Cl. 73-119.00A.
Schenk, Manfred; Klotzner, Winfried; and Jeenicke, Edmund, 4,433,379, Cl. 364-200.000.
Robert Shaw Controls Company: *See*—
Riehl, Fred, 4,433,266, Cl. 313-135.000.
Roberts, Gerald E.; and Staples, Alfred G., to General Electric Company. Crystal filter and method for fabrication. 4,433,316, Cl. 333-189.000.
Roberts, Harry H., to Champion International Corporation. Rear loading single serving pie container and blank for forming same. 4,432,490, Cl. 229-22.000.
Robinson, David, to Fisons plc. 5-Aminoimidazoles as immunoregulants. 4,432,990, Cl. 424-273.00R.
Robinson, Richard H., Jr., to Clark Equipment Company. Upright for lift truck. 4,432,438, Cl. 187-9.00E.
Roca-Nierga, Manuel, to SPICA S.p.A. Device for controlling the angle of advance in a fuel-injection pump of an internal-combustion engine. 4,432,326, Cl. 123-501.000.
Rockcor, Inc.: *See*—
Larson, Douglas A.; Tacke, Kenneth L.; White, Craig A.; and Paxton, Ronald E., 4,433,011, Cl. 427-231.000.
Rockwell International Corporation: *See*—
Best, David W.; and Russell, Jeffrey D., 4,433,412, Cl. 371-25.000.
Carollo, James A.; and Kalinsky, Wayne A., 4,433,277, Cl. 320-24.000.
Jones, Addison B.; and Erdmann, Francis M., 4,432,134, Cl. 29-578.000.
Nicholson, Margie M.; and Pizzarello, Frank A., 4,432,612, Cl. 350-357.000.
Perkins, William C., 4,433,284, Cl. 323-361.000.
Rodloff, Rudiger; and Bentlage, Hans, to Deutsche Forschungs-und Versuchsanstalt fur Luft- und Raumfahrt E.V. Angular velocity sensor based on a ring laser. 4,432,646, Cl. 356-350.000.
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., to Polaroid Corporation. Polyesters containing bis(trifluoromethyl)-biphenylene radicals. 4,433,132, Cl. 528-191.000.
Rogers, Philip J.: *See*—
Campbell, Duncan R. J.; and Rogers, Philip J., 4,432,596, Cl. 350-1.300.
Rohm GmbH: *See*—
Bauer, Kurt H.; Osterwald, Hermann; Lehmann, Klaus; and Dreher, Dieter, 4,433,076, Cl. 523-342.000.
Rohr Industries, Inc.: *See*—
Riel, Frank J., 4,433,021, Cl. 428-116.000.
Rolls-Royce Limited: *See*—
Harman, Geoffrey E.; and James, Malcolm J. F., 4,432,658, Cl. 374-138.000.
Langley, Kenneth R., 4,432,555, Cl. 277-25.000.
Romankiw, Lubomyr T.; and von Gutfeld, Robert J., to International Business Machines Corporation. Automated system for laser mask definition for laser enhanced and conventional plating and etching. 4,432,855, Cl. 204-207.000.
Romeo Maestri & Figli S.p.A.: *See*—
Maestri, Elio, 4,432,484, Cl. 227-126.000.
Ronnkvist, Ake E. Composite sucker rod and method of manufacturing same. 4,432,662, Cl. 403-271.000.
Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,432,992, Cl. 424-274.000.
Root, Stephen J., to Steel Heddle Manufacturing Company. Wrap-around adjustable center brace attachment. 4,432,398, Cl. 139-91.000.
Rosdy, Bela: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.
Rose, John B.; and Cinderey, Michael B., to Imperial Chemical Industries PLC. Production of dihydroxy arylophenones. 4,433,172, Cl. 568-319.000.
Rose, John B.: *See*—
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., 4,433,083, Cl. 524-27.000.
Rosen, Howard N.: *See*—
Chen, Peter Y. S.; Helmer, Wayne A.; and Rosen, Howard N., 4,432,147, Cl. 34-46.000.
Rosink, Albert, to Trutzschler GmbH & Co. KG. Sliver coiler. 4,432,118, Cl. 19-159.00R.
Ross, Gilbert B.; and Stevens, Theodore E. Cultured onyx products and methods therefor. 4,433,070, Cl. 523-171.000.
Rossa, Dennis J. Portable humane cow lift. 4,432,306, Cl. 119-100.000.
Rossi & Catelli S.p.A.: *See*—
Catelli, Camillo, 4,432,276, Cl. 99-453.000.
Rothaar, Bruce C.: *See*—
Stockham, Thomas G., Jr.; and Rothaar, Bruce C., 4,433,348, Cl. 360-51.000.
Rottmaier, Ludwig; and Merten, Rudolf, to Bayer Aktiengesellschaft. Triazolidine-3,5-dione/formaldehyde/amine condensates and compositions thereof. 4,433,085, Cl. 524-83.000.
Rottmaier, Ludwig; and Merten, Rudolf, to Bayer Aktiengesellschaft. Glycoluril salts and a process for the preparation thereof. 4,433,144, Cl. 544-198.000.
Rousseau, Jean P. Miniature flashlight. 4,433,365, Cl. 362-189.000.
Roussel-UCLAF: *See*—
Zeitoun, Paul; and Brisard, Patrick, 4,432,966, Cl. 424-21.000.
Rowan, Hugh H.: *See*—
Buyalos, Edward J.; Rowan, Hugh H.; and Young, Steven A., 4,432,940, Cl. 422-135.000.
Royston Manufacturing Corporation: *See*—
Hewell, Gerald M., 4,432,170, Cl. 52-28.000.
Rubenstein, Edward: *See*—
Hughes, E. Barrie; Rubenstein, Edward; and Hofstadter, Robert, 4,432,370, Cl. 128-654.000.
Rubin, David: *See*—
Hislop, Alfred R.; and Rubin, David, 4,433,314, Cl. 333-110.000.
Rudzki, Eugene M.; Jackson, Ronald W.; and Martocci, Anthony P., to Bethlehem Steel Corporation. Pyrometer method for measuring slab temperature in a reheat furnace. 4,432,657, Cl. 374-126.000.
Ruf, Hans R.; Quattlander, Rolf; Reichlin, Max; and Hilpert, Patrik, to Roag. Apparatus for removing optical component blanks from a blocking tool. 4,432,380, Cl. 134-104.000.
Ruprecht, Hermann: *See*—
Maier, Martin; and Ruprecht, Hermann, 4,432,192, Cl. 56-15.300.
Ruskin Manufacturing Company: *See*—
Becelaere, Robert V., 4,432,272, Cl. 98-1.000.
Russek, Allen S., to Wallant International Trade, Inc. Automatic electrode placement device. 4,432,368, Cl. 128-644.000.
Russell Burdsall & Ward Corporation: *See*—
Capuano, Terry D., 4,432,681, Cl. 411-180.000.
Russell, Frederick E., to Protectaire Systems Company. Sludge removal apparatus. 4,432,870, Cl. 210-143.000.
Russell, Jeffrey D.: *See*—
Best, David W.; and Russell, Jeffrey D., 4,433,412, Cl. 371-25.000.
Russell, John D., to Eaton Corporation. Change speed multiple axle shift lock out. 4,432,431, Cl. 180-248.000.
Russell, Robert L.: *See*—
Lawrence, Phillip G.; and Russell, Robert L., 4,432,590, Cl. 312-257.0SK.
Russo, Carl J.: *See*—
Muka, Richard S.; and Russo, Carl J., 4,433,246, Cl. 250-492.100.
Russo, Vincenzo; and Heesch, Max O., to International Telephone and Telegraph Corporation. Vehicle seat track apparatus. 4,432,583, Cl. 297-330.000.
Ruti Machinery Works Ltd.: *See*—
Bachmann, Hans; and Frey, Robert, 4,432,399, Cl. 139-370.200.
Ryseck, Werner: *See*—
Grage, Ludger; Ryseck, Werner; and Michl, Franz, 4,432,640, Cl. 356-5.000.
S.A.R.L. Commodore International: *See*—
Baguet, Paul R., 4,432,164, Cl. 49-209.000.
Sadamasa, Tetsuo; and Ichikawa, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing display device. 4,432,131, Cl. 29-569.00L.
SAFAMA S. A.: *See*—
Viemon, Bernard, 4,432,717, Cl. 425-429.000.
Saho, Norihide: *See*—
Matsuda, Toshiharu; Kasai, Kenjiro; Kikkawa, Seiichi; Saho, Norihide; and Matumoto, Kouzo, 4,432,216, Cl. 62-514.00R.
Saint, Jacques; and Collignon, Gerard, to Societe d'Etude du Radant. Apparatus for microwave directional coupling between a waveguide and a stripline. 4,433,313, Cl. 333-109.000.
St. Joseph Mercy Hospital Pontiac: *See*—
Pruente, Thomas F.; and Tamargo, Anna, 4,432,522, Cl. 248-215.000.
Saito, Kazuo: *See*—
Tawada, Yoshihisa; Yamamoto, Tetsuro; Ushioda, Minoru; and Saito, Kazuo, 4,433,097, Cl. 524-789.000.
Saito, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air conditioning control method. 4,432,210, Cl. 62-126.000.
Saito, Takashi; and Mochizuki, Masafumi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a mechanism for connecting a lid member to a jacket. 4,433,405, Cl. 369-77.200.
Saito, Takashi; Mochizuki, Masafumi; and Arai, Norimasa, to Victor Company of Japan, Ltd. Rotary recording medium clamping mechanism. 4,433,406, Cl. 369-77.200.
Saito, Takayasu, to Hitachi Koki Company, Limited. Method and apparatus for separating macromolecules or particles in a liquid solution. 4,432,849, Cl. 204-180.00R.
Saito, Yoshio: *See*—
Watanabe, Atsuo; Kaneko, Teruo; Tanaka, Takeo; and Saito, Yoshio, 4,432,939, Cl. 422-93.000.
Saitou, Masao; Iwata, Yasuhiro; and Uchida, Kohachi, to Tokyo Shibaura Denki Kabushiki Kaisha. Reciprocative original carrier locking mechanism. 4,432,639, Cl. 355-75.000.
Saji, Hideo: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,432,318, Cl. 123-339.000.

Sakaguchi, Hirofumi: *See*—
Nosaka, Isao; Sakaguchi, Hirofumi; Shiozawa, Takao; and Fujii, Yozo, 4,432,633, Cl. 355-8.000.
Sakaguchi, Takehiko, to Hioki Denki Kabushiki Kaisha. Direct-writing recorder. 4,433,339, Cl. 346-78.000.
Sakakibara, Kunio: *See*—
Ohta, Kazutoshi; and Sakakibara, Kunio, 4,433,023, Cl. 428-182.000.
Sakakibara, Mitsuhiko: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, 4,433,109, Cl. 525-314.000.
Sakakibara, Susumu: *See*—
Kaneda, Isami; Sakakibara, Susumu; and Sano, Yasushi, 4,433,402, Cl. 369-43.000.
Sakamoto, Koichiro: *See*—
Takeno, Shozo; and Sakamoto, Koichiro, 4,432,247, Cl. 73-862.670.
Sakamoto, Seiichi: *See*—
Hiraga, Masaharu; and Sakamoto, Seiichi, 4,432,708, Cl. 418-55.000.
Sakane, Tadashi: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.
Sakudo, Noriyuki: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Sakurada, Nobuaki; Kiuchi, Masayoshi; and Thunoda, Masahiro, to Canon Kabushiki Kaisha. Film transportation display device. 4,432,628, Cl. 354-289.120.
Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, 4,433,347, Cl. 358-342.000.
Salazar, Paul V. Refractory compositions and method. 4,432,799, Cl. 106-85.000.
Salvadori, Lawrence A.: *See*—
Manschot, James G.; Salvadori, Lawrence A.; and Plekenpol, David D., 4,432,763, Cl. 604-262.000.
Salzgeber, Daniel E., to Stanadyne, Inc. Timing control for fuel injection pump. 4,432,327, Cl. 123-502.000.
Samifi Babcock Samifi Internationale S.A.: *See*—
Richelli, Angelo; and Battistella, Guido, 4,432,214, Cl. 62-341.000.
Sample, Frank C. Trolling motor bracket. 4,432,527, Cl. 248-548.000.
Samsung Electronics Co., Ltd.: *See*—
Choi, Hak-Ki, 4,433,368, Cl. 363-45.000.
San Energy Co., Ltd.: *See*—
Okada, Kiyomi, 4,432,288, Cl. 110-266.000.
Sanagi, Mamoru: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.
Sandberg, Lars: *See*—
Lind, Lars; Melin, Kent; and Sandberg, Lars, 4,432,430, Cl. 180-197.000.
Sanden Corporation: *See*—
Hiraga, Masaharu; and Sakamoto, Seiichi, 4,432,708, Cl. 418-55.000.
Sandner, Bernhard: *See*—
Deiner, Hans; and Sandner, Bernhard, 4,433,027, Cl. 428-260.000.
Sandoz, Inc.: *See*—
Spencer, Homer K., 4,432,989, Cl. 424-273.00R.
Sandoz Ltd.: *See*—
Hasler, Rolf; Henzi, Beat; Schnider, Ernst; and Ulshoefer, Hermann, 4,432,770, Cl. 8-638.000.
Sanford, Emil: *See*—
Seats, Peter; Sanford, Emil; and Waxenbaum, Bernard M., 4,432,464, Cl. 220-2.10A.
Sangamo Weston, Inc.: *See*—
Dyer, Robert E.; Swanson, Scott C.; and Hicks, Robert A., 4,433,387, Cl. 364-900.000.
Sano, Emiko: *See*—
Iizuka, Masahiko; Kubota, Hidenobu; and Sano, Emiko, 4,433,052, Cl. 435-68.000.
Sano, Hironari; and Yui, Hiroshi, to Mitsubishi Petrochemical Company, Ltd. Olefinic polymer composition containing inorganic filler. 4,433,073, Cl. 523-201.000.
Sano, Tatsuhiko: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.
Sano, Tetsu; Yasuzuka, Takezou; Ishiwata, Hisao; and Simizu, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a vacuum vessel provided with a radiation-permeable window. 4,433,230, Cl. 219-118.000.
Sano, Yasushi: *See*—
Kaneda, Isami; Sakakibara, Susumu; and Sano, Yasushi, 4,433,402, Cl. 369-43.000.
Sano, Yoshiaki: *See*—
Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, 4,433,306, Cl. 330-297.000.
Sano, Yumiko: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,433,039, Cl. 430-58.000.
Santamaria Ulecia, Tomas. Device for copying panoramic images. 4,432,140, Cl. 33-20.00C.
Santen, Sven: *See*—
Mathisson, Goran; and Santen, Sven, 4,432,789, Cl. 75-35.000.
Santer, J. Owen; and Spitz, George T., to Monsanto Company. Methylated methylolated melamine composition. 4,433,143, Cl. 544-196.000.
Santimauro, John F., to Mobay Chemical Corporation. Process for the conditioning of an organic pigment. 4,432,796, Cl. 106-19.000.
Sanyo Electric Co., Ltd.: *See*—
Tsuji, Mahito; Kudo, Toshiyuki; and Itoh, Kazuo, 4,433,409, Cl. 369-170.000.
Saphir, Marc E.; and Reed, Michael A. Motion sensing energy controller. 4,433,328, Cl. 340-555.000.
Sarrell, Ivan D.; Bley, David B.; and Tibbets, David W., to Chattanooga Corporation. Therapeutic traction apparatus with monitoring circuit means. 4,432,356, Cl. 128-75.000.
Sarurai, Nobuo; and Kobayashi, Morimasa, to Amada Company, Limited. Method and apparatus for controlling the feeding of a bandsaw blade of horizontal bandsaw machines. 4,432,260, Cl. 83-13.000.
Sasaki, Jack S. Bathing equipment for the handicapped. 4,432,104, Cl. 4-555.000.
Sasaki, Katuhiro, to Pioneer Electronic Corporation. Push-pull amplifier circuit with field-effect transistors. 4,433,303, Cl. 330-264.000.
Sasaya, Hideaki: *See*—
Tsuchiya, Keiji; Sasaya, Hideaki; and Nara, Akio, 4,432,711, Cl. 418-150.000.
Sasmor, Louis: *See*—
Mumford, Van E.; Sasmor, Louis; and Schroeppel, Edward A., 4,432,360, Cl. 128-419.0PG.
Sato, Hitoshi: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.
Sato, Kazuo: *See*—
Goto, Sumio; Doi, Takeshi; and Sato, Kazuo, 4,433,017, Cl. 528-45.000.
Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, 4,432,643, Cl. 356-312.000.
Sato, Keishi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.
Sato, Kozo: *See*—
Ishige, Sadao; Sato, Kozo; and Iwakura, Ken, 4,433,156, Cl. 549-227.000.
Sato, Tadashi: *See*—
Yamamoto, Kazuyoshi; and Sato, Tadashi, 4,432,257, Cl. 81-464.000.
Satoh, Setsuo: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.
Satoh, Toshio: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.
Sattel, John A., to Spacesaver Corporation. Mobile storage apparatus with cantilevered light fixtures. 4,432,589, Cl. 312-198.000.
Saverino, Bennett J. Golf practice apparatus. 4,432,552, Cl. 273-183.00A.
Savoir, Jean-Claude. Support for tablets, capsules, pills or the like. 4,432,455, Cl. 206-531.000.
Sawa, Yuji; and Kudo, Yozo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Article selection apparatus. 4,432,457, Cl. 209-557.000.
Sawada, Yoshikatu; Shirakawa, Kazuo; and Sugiura, Takeo, to Toppan Printing Co., Ltd.; and Nippi, Inc. Water based photosensitive composition with hydrolyzate of mammal collagen. 4,433,043, Cl. 430-175.000.
Sawyer, Edgar W., Jr., to International Telephone and Telegraph Corporation. Combustible coal/water mixtures for fuels and methods of preparing the same. 4,432,771, Cl. 44-51.000.
Scarberry, Walter P.; and Vollman, Charles K., to Health-Ex Corporation. Coextrusion method and apparatus. 4,432,826, Cl. 156-244.110.
Schaefer, Nikolaus; Dellmann, Winfried; and Louis, Gerd, to Bergwerksverband GmbH. Method for the selective removal and recovery of ammonia from ammonia- and hydrogen sulfide-containing gas mixtures. 4,432,958, Cl. 423-356.000.
Schafer, Jurgen: *See*—
Fischer, Helmut; Schafer, Jurgen; and Thomas, Gunter, 4,433,265, Cl. 313-22.000.
Scheithauer, Richard A.: *See*—
Vanderpool, Clarence D.; Scheithauer, Richard A.; and Warmington, Richard G., 4,432,950, Cl. 423-61.000.
Schenectady Chemicals, Inc.: *See*—
Laganis, Deno; and Yodis, John, 4,433,080, Cl. 523-414.000.
Schenk, Manfred; Klotzner, Winfried; and Jeenicke, Edmund, to Robert Bosch GmbH. Microcomputer system with input/output unit connected to the remainder of the system by a single multibit bus and several sequential data lines. 4,433,379, Cl. 364-200.000.
Schering Aktiengesellschaft: *See*—
Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, 4,432,976, Cl. 424-241.000.
Henze, Helmut; and Capell, Ronald, 4,433,009, Cl. 427-97.000.

Scheurecker, Werner; and Spanner, Herbert, to Voest-Alpine Aktiengesellschaft. Arrangement at a supporting and guiding structure to be used in a continuous casting plant. 4,432,407, Cl. 164-448.000.

Schiene, Karl: *See*—
Beutler, Gerhard; Berthold, Heinz; Morsch, Joachim; and Schiene, Karl, 4,432,703, Cl. 417-217.000.

Schifftner, Kenneth C., to Kenneth C. Schifftner, Inc. Mass transfer contact apparatus. 4,432,914, Cl. 261-111.000.

Schipper, Edgar S.: *See*—
Shalaby, Shalaby W.; Schipper, Edgar S.; and Koelmel, Donald F., 4,433,161, Cl. 560-66.000.

Schlag, Edward W.: *See*—
Boesl, Ulrich; Neusser, Hans J.; and Schlag, Edward W., 4,433,241, Cl. 250-282.000.

Schleich, Kuno: *See*—
Petrzilka, Martin; and Schleich, Kuno, 4,432,885, Cl. 252-299.610.

Schlich, Elmar: *See*—
Henrich, Edmund; and Schlich, Elmar, 4,432,955, Cl. 423-249.000.

Schlumberger Technology Corporation: *See*—
Seeman, Bronislaw, 4,433,240, Cl. 250-256.000.

Schluter, Manfred: *See*—
Groeneweg, Joost; and Schluter, Manfred, 4,432,869, Cl. 210-602.000.

Schmalzbauer, Arnold R.: *See*—
Hanson, Merlin L.; Swenson, Robert E.; and Schmalzbauer, Arnold R., 4,433,374, Cl. 364-200.000.

Schmid, Rolf: *See*—
Bahn, Michael; Preuss, Wolfgang; Schmid, Rolf; and Wagner, Rudiger, 4,432,905, Cl. 260-397.100.

Schmidt, Christian E. Tipple. 4,432,688, Cl. 414-358.000.

Schmidt, Detlef E., to Topper Manufacturing Corporation. Compact collapsible microform viewer. 4,432,619, Cl. 353-119.000.

Schmidt, Dieter; and Engler, Rolf, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.V. Ultrasonic transducer. 4,432,237, Cl. 73-632.000.

Schmidt, Viktor: *See*—
Arendt, Gerhard; Benz, Roland; Engenhart, Reinhold; and Schmidt, Viktor, 4,432,501, Cl. 242-47.000.

Schmidt, Walter: *See*—
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.

Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd. Monopolar filter-press type electrolyzer. 4,432,858, Cl. 204-257.000.

Schmitt, Larry D., to Conchemco Incorporated. Method and apparatus for controlling blade clutch assembly. 4,432,191, Cl. 56-11.800.

Schmitz, H.-Joachim; Braun, Dieter; Trodler, Dieter; and Cramer, Hugo, to Felten & Guilleaume Carlswerk Aktiengesellschaft. Telephone cable. 4,432,196, Cl. 57-204.000.

Schmitz, Henry: *See*—
Kaneko, Takushi; Essery, John M.; Schmitz, Henry; and Doyle, Terrence W., 4,433,158, Cl. 549-332.000.

Schnable, George L.; and James, Edward A., to RCA Corporation. Doped-oxide diffusion of phosphorus using borophosphosilicate glass. 4,433,008, Cl. 427-85.000.

Schneider, Harold N.; Simpson, James H.; and Weidman, Raymond F., to General Electric Company. Impedance contact assembly for an electric circuit breaker. 4,433,221, Cl. 200-144.0AP.

Schnider, Ernst: *See*—
Hasler, Rolf; Henzi, Beat; Schnider, Ernst; and Ulshoefer, Hermann, 4,432,770, Cl. 5-638.000.

Schoeber, Willem J. A. H.: *See*—
van der Burgt, Maarten J.; Boelema, Sikke J. A.; Schoeber, Willem J. A. H.; and Zuideveld, Pieter L., 4,433,065, Cl. 518-703.000.

Scholl, Hans-Joachim, to Bayer Aktiengesellschaft. Diamines and a process for their preparation. 4,433,169, Cl. 564-419.000.

Schroeppel, Edward A.: *See*—
Mumford, Van E.; Sasmor, Louis; and Schroeppel, Edward A., 4,432,360, Cl. 128-419.0PG.

Schroter, Hans-Jurgen: *See*—
Juntgen, Harald; Knoblauch, Karl; Reichenberger, Jurgen; and Schroter, Hans-Jurgen, 4,432,774, Cl. 55-25.000.

Schubert, Hans; and Baessler, Konrad, to Hoechst AG. Process for the purification of crude 3,4,3',4'-tetraaminodiphenyl. 4,433,168, Cl. 564-309.000.

Schultz, James R.; Smith, Francis E.; and Jurecki, Ralph J., to Cole National Corporation. Glass ware etching apparatus. 4,432,169, Cl. 51-424.000.

Schultz, John C., to Houdaille Industries, Inc. Caster shimmy damper including a viscous damping medium. 4,432,116, Cl. 16-35.00D.

Schultz, John C., to Houdaille Industries, Inc. Viscous damper having rigid plastic structure. 4,432,254, Cl. 74-574.000.

Schumacher, Walter: *See*—
Hilaire, Pierre; Lietaert, Franz; Staroz, Claude; and Schumacher, Walter, 4,432,793, Cl. 75-130.00R.

Schummer, Helmut: *See*—
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.

Schurig, Helmuth: *See*—
Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd, 4,432,858, Cl. 204-257.000.

Schuster, Karl, to Siemens Aktiengesellschaft. High gradient magnetic separation device. 4,432,873, Cl. 210-223.000.

Schutz, Hans-Ulrich: *See*—
Back, Gerhard; Beffa, Fabio; and Schutz, Hans-Ulrich, 4,432,898, Cl. 260-145.00A.

Schwab, Richard E., to Bell Telephone Laboratories, Incorporated. Self-adjusting fiberoptic connector assembly. 4,432,604, Cl. 350-96.210.

Schwark, O. Jay; and Loomba, Yogendra S., to Allied Corporation. Electrically released seat belt buckle. 4,432,119, Cl. 24-603.000.

Schwartz, Michael M.; Knox, Jack R.; and Paschke, Edward E., to Standard Oil Company (Indiana). Poly (p- and m-methylenebenzoate) blends with polyarylates. 4,433,118, Cl. 525-437.000.

Schwartz, William C.; and Blalock, Paul B., to Burlington Industries, Inc. Three-dimensional ceiling board facing. 4,433,022, Cl. 428-158.000.

Schwarz, Alois: *See*—
Stephan, Michael; Mautz, Karlheinz; and Schwarz, Alois, 4,432,696, Cl. 416-134.00A.

Schwarz, Helmut: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.

Schwarzmann, Matthias: *See*—
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,433,188, Cl. 585-640.000.

Scifres, Donald R.: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,433,417, Cl. 372-45.000.

Scoma Energie: *See*—
Redele, Jean E. A., 4,432,329, Cl. 123-557.000.

Scott, Kenneth G. Floating planter. 4,432,292, Cl. 111-52.000.

Scott, Lewis A., to Omark Industries, Inc. Circular saw blade. 4,432,264, Cl. 83-835.000.

Scott Paper Company: *See*—
Pociluyko, Alex, 4,432,900, Cl. 260-160.000.

Sculler, Leonard H.: *See*—
Wall, Alexander C.; and Sculler, Leonard H., 4,432,281, Cl. 101-334.000.

Seachman, Ned J.: *See*—
Stoffel, James C.; Seachman, Ned J.; Hauber, Jack R.; and Kingsley, William, 4,433,346, Cl. 358-293.000.

Seagold Industries Corporation: *See*—
Keefer, Bowie G., 4,432,876, Cl. 210-652.000.

Sealright Co., Inc.: *See*—
MacEwen, George E., 4,432,473, Cl. 222-327.000.

Seats, Peter; Sanford, Emil; and Waxenbaum, Bernard M., to Thomas Electronics, Inc. Large metal cone cathode ray tubes, and envelopes therefor. 4,432,464, Cl. 220-2.10A.

Seattle Manufacturing Corporation: *See*—
Clark, James R.; and Reeves, Michael K., 4,432,404, Cl. 145-2.00R.

Seeman, Bronislaw, to Schlumberger Technology Corporation. Method and apparatus for measuring gamma rays in a borehole. 4,433,240, Cl. 250-256.000.

Seib, Karl: *See*—
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,433,112, Cl. 525-326.900.

Seiko Instruments & Electronics Ltd.: *See*—
Shida, Masaharu; and Ueda, Makoto, 4,433,401, Cl. 368-204.000.
Yokosuka, Koichi, 4,432,476, Cl. 224-164.000.

Seita, Kenzo: *See*—
Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, 4,433,133, Cl. 528-232.000.

Sekiguchi, Tomoaki: *See*—
Oya, Akiyoshi; and Sekiguchi, Tomoaki, 4,432,265, Cl. 84-1.010.

Sekine, Hiroyasu: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.

Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Cetronio, Antonio, 4,433,006, Cl. 427-39.000.

Seliger, Hartmut; Rastl, Eva; and Swetly, Peter, to Dr. Karl Thomae GmbH. Tridecadeoxynucleotide, process for preparation thereof, and use thereof. 4,433,140, Cl. 536-27.000.

Senda, Kenichi; Nishida, Tatehiko; and Nakagawa, Masao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Expandable thermoplastic polymer beads with method of producing same. 4,433,029, Cl. 428-407.000.

Senshu, Takao: *See*—
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.

Sequin, Hector. Machine tool clamp. 4,432,538, Cl. 269-92.000.

Serginson, Alan: *See*—
Hutchinson, Paul; and Serginson, Alan, 4,432,474, Cl. 222-402.150.

Seton Company: *See*—
Cioca, Gheorghe, 4,432,888, Cl. 252-354.000.

Seymour, Samuel L., to PPG Industries, Inc. Support for hot glass sheets of non-rectangular outline prior to bending. 4,432,782, Cl. 65-25.200.

Shah, Mahendra R.: *See*—
Jayaraman, Viswanath; and Shah, Mahendra R., 4,432,791, Cl. 75-65.00R.

Shah, Rajni C.: *See*—
Huibers, Derk T. A.; Chao, James C.; and Shah, Rajni C., 4,433,184, Cl. 568-863.000.

Shaines, Alfred: *See*—
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, 4,432,922, Cl. 264-119.000.
Shalaby, Shalaby W.; Schipper, Edgar S.; and Koelmel, Donald F., to Ethicon, Inc. Methyl p-(ω-acetoxyalkoxy) benzoate and method of preparation. 4,433,161, Cl. 560-66.000.
Shelby, Billy L.; and DeCandia, Giovanni, to International Telephone and Telegraph Corporation. Luminaire mounting structure. 4,433,367, Cl. 362-370.000.
Shell, John W.; and Gale, Robert M., to ALZA Corporation. Topical composition containing steroid in two forms released independently from polymeric carrier. 4,432,964, Cl. 424-14.000.
Shell, Melvin E. Apparatus and method for handling cargo using flexible support straps. 4,432,689, Cl. 414-416.000.
Shell Oil Company: *See*—
van der Burgt, Maarten J.; Boelema, Sikke J. A.; Schoeber, Willem J. A. H.; and Zuideveld, Pieter L., 4,433,065, Cl. 518-703.000.
Westra, Simon; and Hogervorst, Johannes R., 4,432,671, Cl. 405-226.000.
Shelton, Gerald L.: *See*—
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,433,233, Cl. 219-553.000.
Sherman, Benjamin F., Jr.; and Francis, Samuel. Cap retaining device. 4,432,120, Cl. 24-299.000.
Sherman, Michael I.; and Richter, Johan C. F. C., to Kamyr, Inc. Vessel false bottoming. 4,432,836, Cl. 162-237.000.
Shibata, Akira, to Chugai Denki Kogyo Kabushiki Kaisha. Method of overlaying stainless steel material for decorative articles and ornaments with a precious metal alloy. 4,432,487, Cl. 228-194.000.
Shida, Masaharu; and Ueda, Makoto, to Seiko Instruments & Electronics Ltd. Electronic timepiece having a stepping motor and driving circuit compensated for power source variations. 4,433,401, Cl. 368-204.000.
Shida, Shigeru; Hosaka, Nobuyoshi; Ishikawa, Yuichi; and Nishida, Osamu, to Hitachi, Ltd. Anti-crevice corrosion sealant and method for anti-crevice corrosion. 4,433,093, Cl. 524-433.000.
Shikoku Chemicals Corporation: *See*—
Shimamura, Tadao; and Kano, Naoki, 4,432,959, Cl. 423-365.000.
Shilcock, John: *See*—
Denmark, James; and Shilcock, John, 4,432,579, Cl. 294-87.200.
Shillito, Keith R.: *See*—
Gowan, John G.; and Shillito, Keith R., 4,433,045, Cl. 430-321.000.
Shimada, Mitsuhiro, to Hamamatsu Photonics Kabushiki Kaisha. Automatic brightness control and warning circuit for image intensifier tube. 4,433,236, Cl. 250-213.0VT.
Shimada, Toshikazu: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Shimamura, Tadao; and Kano, Naoki, to Shikoku Chemicals Corporation. Process of producing sodium cyanuarate. 4,432,959, Cl. 423-365.000.
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, to Kawasaki Steel Corporation. Flame gunning of refractory linings. 4,432,533, Cl. 266-44.000.
Shimizu, Seiichi; and Iguchi, Kouichi, to Nissan Motor Co., Ltd. Vapor lock and percolation phenomena inhibiting system. 4,432,328, Cl. 123-516.000.
Shimizu, Senzo: *See*—
Miyamoto, Akira; Shimizu, Senzo; Yamamiya, Kazuo; and Harada, Masahiro, 4,433,136, Cl. 528-347.000.
Shimizu, Shigeaki: *See*—
Kubo, Yoshimi; Shimizu, Shigeaki; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,432,935, Cl. 419-2.000.
Shimizu, Toshiharu: *See*—
Okuyama, Nobutaka; Shimizu, Toshiharu; and Naito, Yoshikazu, 4,433,318, Cl. 335-213.000.
Shimizu, Toshio: *See*—
Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, 4,433,229, Cl. 219-84.000.
Shimoda, Shinichi: *See*—
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,432,856, Cl. 204-237.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Ichinohe, Shoji; Takahashi, Kouzou; and Tanaka, Yasuharu, 4,433,125, Cl. 526-279.000.
Okamoto, Haruo; and Yamada, Motoyuki, 4,432,781, Cl. 65-18.200.
Shintani, Akira: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Shiono, Manzo: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.
Shionogi & Company, Limited: *See*—
Hirai, Kentaro, 4,433,154, Cl. 548-195.000.
Ogawa, Yasunao; Noto, Akira; Mori, Sachio; and Yoshioka, Mitsuru, 4,433,139, Cl. 536-17.200.
Shiozawa, Takao: *See*—
Nosaka, Isao; Sakaguchi, Hirofumi; Shiozawa, Takao; and Fujii, Yozo, 4,432,633, Cl. 355-8.000.
Shirai, Masanari; and Yanagawa, Hitoshi, to Canon Kabushiki Kaisha. Apparatus for feeding film. 4,432,509, Cl. 242-195.000.
Shirakawa, Kazuo: *See*—
Sawada, Yoshikatu; Shirakawa, Kazuo; and Sugiura, Takeo, 4,433,043, Cl. 430-175.000.
Shiraki, Yasuhiro: *See*—
Maruyama, Eiichi; Shimada, Toshikazu; Shiraki, Yasuhiro; Katayama, Yoshifumi; Matsubara, Hirokazu; Ishizaka, Akitoshi; Murayama, Yoshimasa; and Shintani, Akira, 4,433,202, Cl. 136-255.000.
Shirakuma, Takashi; Nakamichi, Fujio; and Iguchi, Osamu, to Tokico, Ltd. Compressor having a starting load reducing apparatus. 4,432,698, Cl. 417-27.000.
Shirasaka, Yusei; Fuse, Kenichi; and Umezu, Haruo, to Furukawa Electric Co., Ltd., The. Method of exfoliating coating of coated optical fiber. 4,432,807, Cl. 134-2.000.
Shirley, Dewey D. Underground irrigator. 4,432,291, Cl. 111-7.100.
Shirouzu, Ryusuke: *See*—
Hirayama, Masaru; Anzai, Nobuaki; and Shirouzu, Ryusuke, 4,433,322, Cl. 338-162.000.
Shook, William B.: *See*—
Helferich, Richard L.; and Shook, William B., 4,432,798, Cl. 106-38.300.
Shutler, Stephen W.: *See*—
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.
Sicignano, Albert; Werkhoven, Christiaan J.; and van der Weg, Werner F., to U.S. Philips Corporation. Method for improving luminescence and electrical properties in semiconductor materials by electron irradiation at liquid nitrogen temperatures. 4,432,810, Cl. 148-1.500.
Siemens Aktiengesellschaft: *See*—
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, 4,432,199, Cl. 57-294.000.
Eichrodt, Dieter; and Elsen, Friedhelm, 4,433,372, Cl. 377-116.000.
Emshoff, Horst W.; and Kusebauch, Walter, 4,432,878, Cl. 210-662.000.
Finkenzeller, Johann; and Reinhardt, Juergen, 4,433,429, Cl. 378-99.000.
Fredzell, Georg, 4,433,430, Cl. 378-108.000.
Furjanic, Ivan, 4,433,330, Cl. 340-750.000.
Gefroerer, Stanislaus; and Vollmeyer, Werner, 4,433,411, Cl. 370-80.000.
Grage, Ludger; Ryseck, Werner; and Michl, Franz, 4,432,640, Cl. 356-5.000.
Haendle, Joerg; and Alexandrescu, Mircea, 4,433,428, Cl. 378-95.000.
Herkiotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.
Lange, Gerhard; and Boy, Jurgen, 4,433,354, Cl. 361-120.000.
Pfeiler, Manfred, 4,433,431, Cl. 378-157.000.
Schuster, Karl, 4,432,873, Cl. 210-223.000.
Siemens Corporation: *See*—
Fasang, Patrick P., 4,433,413, Cl. 371-25.000.
Siempelkamp, Dieter; and Gotz, Wolfgang, to G. Siempelkamp GmbH & Co. Method of an apparatus for mounting a foil on a plate. 4,432,828, Cl. 156-285.000.
Siff, Elliott J.; and Emmerich, Claude L. Intravenous delivery system. 4,432,468, Cl. 222-55.000.
Sikkenga, David L.; Nevitt, Thomas D.; and Jerome, Norman F., to Standard Oil Company (Indiana). Process to convert linear alkanes. 4,433,190, Cl. 585-660.000.
Sillion, Bernard: *See*—
Weill, Jerome; Garapon, Jacques; and Sillion, Bernard, 4,433,157, Cl. 549-255.000.
Silverman, Robert A.; and Hoyen, Harry A., to Eastman Kodak Company. Photographic elements containing direct-positive emulsions and processes for their use. 4,433,047, Cl. 430-409.000.
Simig, Gyula: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.
Simizu, Tatsuo: *See*—
Sano, Tetsu; Yasuzuka, Takezou; Ishiwata, Hisao; and Simizu, Tatsuo, 4,433,230, Cl. 219-118.000.
Simon, Hans. Strain relief assembly. 4,432,520, Cl. 248-56.000.
Simpson, James H.: *See*—
Schneider, Harold N.; Simpson, James H.; and Weidman, Raymond F., 4,433,221, Cl. 200-144.0AP.
Sims, Don G. Rotating disc gate valve. 4,432,387, Cl. 137-329.020.
Sincerbox, Glenn T.: *See*—
Bjorklund, Gary C.; and Sincerbox, Glenn T., 4,432,597, Cl. 350-3.700.
Sindlinger, Ronald E., to GTE Products Corporation. Subminiature flashlamp mount design. 4,432,725, Cl. 431-362.000.
Singer Company, The: *See*—
Weisbord, Leon E.; and Wessbecher, Francis W., 4,433,260, Cl. 310-156.000.
Singh, Baldev: *See*—
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,432,981, Cl. 424-251.000.
Singleton, Thomas C., to Monsanto Company. Process for stabilizing carbonylation catalyst in soluble form. 4,433,165, Cl. 562-519.000.

Singleton, Thomas C.; and Paulik, Frank E., to Monsanto Company. Process for stabilizing carbonylation catalyst in soluble form. 4,433,166, Cl. 562-519.000.
Sipkema, Rudolf: *See—*
Beckers, Jozeph H. M.; and Sipkema, Rudolf, 4,433,146, Cl. 544-201.000.
Sirotnak, Francis M.: *See—*
DeGraw, Joseph I., Jr.; and Sirotnak, Francis M., 4,433,147, Cl. 544-260.000.
Siryj, Bohdan W.; and Lazzery, Angelo G., to RCA Corporation. Protective cartridge for optical discs. 4,433,410, Cl. 369-291.000.
Skarky, Floyd E. Dental tray. 4,432,728, Cl. 433-37.000.
SKF Kugellagerfabriken GmbH: *See—*
Winkler, Ottmar, 4,432,741, Cl. 464-145.000.
SKF Steel Engineering: *See—*
Mathisson, Goran; and Santen, Sven, 4,432,789, Cl. 75-35.000.
Skipworth, Walter J., to Glassco, Inc. Can crushing apparatus. 4,432,278, Cl. 100-53.000.
Slate, Matthew W.: *See—*
McCalmont, Arnold M.; and Slate, Matthew W., 4,433,211, Cl. 179-1.50S.
Small, Gerald J.: *See—*
Hayes, John M.; and Small, Gerald J., 4,432,225, Cl. 73-23.100.
Smith, Dorsey T.; Bieser, Albert H.; and Kintzinger, Warren H., to Tracor BEI, Inc. Passive stabilization conversion unit. 4,433,337, Cl. 343-765.000.
Smith, Francis E.: *See—*
Schultz, James R.; Smith, Francis E.; and Jurecki, Ralph J., 4,432,169, Cl. 51-424.000.
Smith, Gerald L.: *See—*
Bacon, James L.; and Smith, Gerald L., 4,432,631, Cl. 355-3.0CH.
Smith, Irl W., to Raytheon Company. Off-axis astigmatic unstable laser resonator. 4,433,418, Cl. 372-95.000.
Smith, Peter J.: *See—*
Levey, George; and Smith, Peter J., 4,432,249, Cl. 73-863.830.
Smith, Ralph N., to Commonwealth of Australia, The. Impulse noise generator. 4,432,299, Cl. 116-137.00R.
Smith, Rodney I. Post-tensioned concrete slab. 4,432,175, Cl. 52-224.000.
Smith, Roger D.: *See—*
Wiatt, James G.; Calvert, James W.; Belcher, Samuel L.; and Smith, Roger D., 4,432,720, Cl. 425-534.000.
Smith, Ronald A., to Arro-Mac Manufacturing Inc. Clamp assembly for self-rimming sinks or basins. 4,432,106, Cl. 4-633.000.
Smith, Sanford N., to Phillips Petroleum Company. Method and apparatus for separating particulate materials from fibrous materials. 4,432,867, Cl. 209-140.000.
Smith, Thomas W.: *See—*
Badesha, Santokh S.; Smith, Thomas W.; and Loutfy, Rafik O., 4,432,841, Cl. 204-14.00N.
Smith, William E., to United States of America, Air Force. Corratherm expansion fixture. 4,432,485, Cl. 228-44.10R.
Smythe, Hugh A.: *See—*
Clark, Robert F.; and Smythe, Hugh A., 4,432,107, Cl. 5-436.000.
Snyder, Thomas A.; and Leible, Walter T., to Hillwood Corporation. Self-contained swab unit. 4,432,749, Cl. 604-2.000.
Societa' Industriale Bagnolo S.I.B. S.r.l.: *See—*
Dorigo, Oddino, 4,432,450, Cl. 198-832.000.
Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
de Jaeger, Bogena, 4,433,425, Cl. 375-113.000.
Societe de Materials Annexed de Dialyse S.M.A.D.: *See—*
Lopez, Georges, 4,432,764, Cl. 604-283.000.
Societe de Recherches Industrielles (S.O.R.I.): *See—*
Picart, Francois, 4,432,973, Cl. 424-180.000.
Societe d'Etude du Radant: *See—*
Saint, Jacques; and Collignon, Gerard, 4,433,313, Cl. 333-109.000.
Societe d'Etudes, de Realisations et d'Applications Techniques (S.E.R.A.T.): *See—*
Castagner, Bernard; Carre, Paul; and Moise, Gervais, 4,432,269, Cl. 89-1.816.
Societe Dupre: *See—*
Dupre, Armand, 4,432,121, Cl. 24-343.000.
Societe Industrielle Auer: *See—*
Godin, Pascal, 4,432,307, Cl. 122-14.000.
Societe Nobel Bozel: *See—*
Hilaire, Pierre; Lietaert, Franz; Staroz, Claude; and Schumacher, Walter, 4,432,793, Cl. 75-130.00R.
Solberg, John C.; Piggin, Roger H.; and Wilgus, Herbert S., to Eastman Kodak Company. Radiation-sensitive silver bromoiodide emulsions, photographic elements, and processes for their use. 4,433,048, Cl. 430-434.000.
Solomon, David E.: *See—*
Teitel, Robert J.; and Solomon, David E., 4,432,933, Cl. 376-152.000.
Someno, Noboru: *See—*
Munekata, Katsusuke; Furuno, Hiroshi; and Someno, Noboru, 4,432,652, Cl. 368-69.000.
Sommer Co.: *See—*
Sommer, Gordon M., 4,432,443, Cl. 192-12.00R.
Sommer, Gordon M., to Sommer Co. Clutch and brake and improved universal coupling. 4,432,443, Cl. 192-12.00R.
Sonell Products Limited: *See—*
McFarlane, John; and Guy, Andrew, 4,432,332, Cl. 123-587.000.
Sony Corporation: *See—*
Katakura, Masayuki; Akagiri, Kenzo; and Ookouchi, Motomi, 4,433,254, Cl. 307-350.000.
Kurosawa, Nobuyuki; and Suda, Kazuaki, 4,433,209, Cl. 381-1.000.
Munekata, Katsusuke; Furuno, Hiroshi; and Someno, Noboru, 4,432,652, Cl. 368-69.000.
Okamura, Toshihiko, 4,433,259, Cl. 310-89.000.
Sopha, Timothy J., to Otto Engineering, Inc. Multicomponent liquid mixing and dispensing assembly. 4,432,470, Cl. 222-135.000.
Soundstream, Inc.: *See—*
Stockham, Thomas G., Jr.; and Rothaar, Bruce C., 4,433,348, Cl. 360-51.000.
Spacesaver Corporation: *See—*
Sattel, John A., 4,432,589, Cl. 312-198.000.
Spanner, Herbert: *See—*
Scheurecker, Werner; and Spanner, Herbert, 4,432,407, Cl. 164-448.000.
Spaulding, Lawrence D.: *See—*
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Cole, Billy W., 4,432,311, Cl. 123-90.670.
Holtzberg, Matthew W.; and Spaulding, Lawrence D., 4,432,925, Cl. 264-235.000.
Spencer, Homer K., to Sandoz, Inc. αAryl-1H-imidazole-1-ethanols. 4,432,989, Cl. 424-273.00R.
Spencer, Peter. Apparatus for the distillation and thermal cracking of a crude oil feedstock and a reactor for use therein. 4,432,941, Cl. 422-140.000.
Sperry Corporation: *See—*
Hanson, Merlin L.; Swenson, Robert E.; and Schmalzbauer, Arnold R., 4,433,374, Cl. 364-200.000.
Kurth, Richard R., 4,433,422, Cl. 375-10.000.
McMahon, Donald H., 4,432,599, Cl. 350-96.150.
SPICA S.p.A.: *See—*
Roca-Nierga, Manuel, 4,432,326, Cl. 123-501.000.
Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH: *See—*
Stahlecker, Gerd, 4,432,195, Cl. 57-87.000.
Spitz, George T.: *See—*
Santer, J. Owen; and Spitz, George T., 4,433,143, Cl. 544-196.000.
Spivack, John D., to Ciba-Geigy Corporation. Alkylated 2,2'-biphenylene phosphonates and stabilized compositions. 4,433,087, Cl. 524-117.000.
Sprecher & Schuh AG: *See—*
Buhler, Anton; and Hug, Peter, 4,433,220, Cl. 200-144.0AP.
Squires, David R., to Intersil. Monolithic voltage divider. 4,433,282, Cl. 323-281.000.
Stahlecker, Gerd, to Spindelfabrik Suessen, Schurr, Stahlecker & Grill GmbH. Device for interrupting the feed of a roving to drawing frames. 4,432,195, Cl. 57-87.000.
Stahler, John A.; and Yamaguchi, Takashi. Method and apparatus for calibrating pumps. 4,432,230, Cl. 73-168.000.
Stahlwerke Peine-Salzgitter AG: *See—*
Klose, Reinhard; and Glienke, Gunter, 4,432,674, Cl. 406-19.000.
Stalder, Herbert: *See—*
Bischofberger, Jurg; and Stalder, Herbert, 4,432,200, Cl. 57-304.000.
Stamicarbon B.V.: *See—*
Beckers, Jozeph H. M.; and Sipkema, Rudolf, 4,433,146, Cl. 544-201.000.
Stanadyne, Inc.: *See—*
Salzgeber, Daniel E., 4,432,327, Cl. 123-502.000.
Standard-Knapp, Inc.: *See—*
Raudat, John L., 4,432,189, Cl. 53-497.000.
Standard Microsystems Corporation: *See—*
Zapisek, John M., 4,433,253, Cl. 307-297.000.
Standard Oil Co., The: *See—*
Herrington, Daniel R.; and Kuch, Philip L., 4,432,960, Cl. 423-539.000.
Standard Oil Company (Indiana): *See—*
Cox, Gordon F. N.; and Nolte, Kenneth G., 4,432,669, Cl. 405-217.000.
Fields, Ellis K., 4,432,847, Cl. 204-158.00R.
Hagen, Gary P., 4,433,174, Cl. 568-459.000.
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Cole, Billy W., 4,432,311, Cl. 123-90.670.
Holtzberg, Matthew W.; and Spaulding, Lawrence D., 4,432,925, Cl. 264-235.000.
Schwartz, Michael M.; Knox, Jack R.; and Paschke, Edward E., 4,433,118, Cl. 525-437.000.
Sikkenga, David L.; Nevitt, Thomas D.; and Jerome, Norman F., 4,433,190, Cl. 585-660.000.
Standard Textile Company, Inc.: *See—*
Molde, Bradley J., 4,433,026, Cl. 428-252.000.
Stanier, Colin S., to Imperial Chemical Industries PLC. Cladding cathodes of electrolytic cell with diaphragm or membrane. 4,432,857, Cl. 204-253.000.
Staples, Alfred G.: *See—*
Roberts, Gerald E.; and Staples, Alfred G., 4,433,316, Cl. 333-189.000.
Star Packaging Corporation: *See—*
Andrews, Harold D., 4,432,188, Cl. 53-436.000.
Starai, Rudolph: *See—*
Parker, Robert R.; and Starai, Rudolph, 4,432,618, Cl. 353-25.000.
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, to Veb Gaskombinat Schwarze Pumpe. Slag breaker of pressure-type coal gasifier. 4,432,772, Cl. 48-66.000.

Staroz, Claude: *See*—
Hilaire, Pierre; Lietaert, Franz; Staroz, Claude; and Schumacher, Walter, 4,432,793, Cl. 75-130.00R.
Stauber, Hans-Ulrich, to Ferag AG. Apparatus for forming stacks from continuously arriving flat products, especially printed products, particularly those arriving in a lapped or imbricated stream. 4,432,685, Cl. 414-31.000.
Stauber, R. C.: *See*—
Napp, E. Thomas; Stauber, R. C.; and Lillegard, Thomas R., 4,432,231, Cl. 73-290.00V.
Stauber, Ronald C.: *See*—
Bellotti, Marc; Laurin, Dean G.; Stauber, Ronald C.; and Taylor, Larry C., 4,432,766, Cl. 604-283.000.
Stauffer Chemical Company: *See*—
Fesman, Gerald, 4,433,071, Cl. 521-107.000.
Wong, Rayman Y., 4,432,909, Cl. 260-501.110.
Steber, Charles E.: *See*—
Davis, Lewis B., Jr.; and Steber, Charles E., 4,432,207, Cl. 60-723.000.
Steel Heddle Manufacturing Company: *See*—
Root, Stephen J., 4,432,398, Cl. 139-91.000.
Steel Research Incorporated: *See*—
Taft, Buckie A., 4,432,178, Cl. 52-334.000.
Steele, Donald F., to Northern Solar Systems, Inc. Rotary heat regenerator wheel and method of manufacture thereof. 4,432,409, Cl. 165-8.000.
Stephan, Michael; Mautz, Karlheinz; and Schwarz, Alois, to Messerschmitt-Boelkow-Blohm GmbH. Rotor structure for a rotary wing aircraft. 4,432,696, Cl. 416-134.00A.
Stephan, Rudolf: *See*—
Brandstetter, Franz; Hambrecht, Juergen; and Stephan, Rudolf, 4,433,102, Cl. 525-75.000.
Sterling Drug Inc.: *See*—
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,432,981, Cl. 424-251.000.
Stern, Ronald C.: *See*—
Heinecke, Rudolf A. H.; and Stern, Ronald C., 4,433,012, Cl. 427-252.000.
Sterner, Russell L., to Kiddie, Inc. Pipe manipulator. 4,432,691, Cl. 414-735.000.
Stevens, David A.: *See*—
Klomp, Edward D.; and Stevens, David A., 4,432,312, Cl. 123-188.0VA.
Stevens, Theodore E.: *See*—
Ross, Gilbert B.; and Stevens, Theodore E., 4,433,070, Cl. 523-171.000.
Stevenson, Joan M.; and Pipkorn, Mark G., to Queen's University at Kingston. Delay timer for a camera. 4,432,624, Cl. 354-238.100.
Stiebellehner, Johann; and Machner, Peter, to Vereinigte Edelstahlwerke Aktiengesellschaft. Method of making seamless tubing. 4,432,811, Cl. 148-2.000.
Stipek, Theodor: *See*—
Brasseur, Georg; Lehner, Gerhard; Herzog, Peter; Rathmayr, Heinz; and Stipek, Theodor, 4,432,320, Cl. 123-357.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Authorization card. 4,432,567, Cl. 283-83.000.
Stockham, Thomas G., Jr.; and Rothaar, Bruce C., to Soundstream, Inc. Apparatus and method for requiring proper synchronization of a digital data flow. 4,433,348, Cl. 360-51.000.
Stoffel, James C.; Seachman, Ned J.; Hauber, Jack R.; and Kingsley, William, to Xerox Corporation. Raster input scanner. 4,433,346, Cl. 358-293.000.
Stokes, Arnold T.: *See*—
Betts, Robert E.; Williams, Nathan P.; and Stokes, Arnold T., 4,432,202, Cl. 60-221.000.
Stone & Webster Engineering Corp.: *See*—
Koppel, Paul E.; Williams, Joseph J.; and Woebcke, Herman N., 4,433,193, Cl. 585-752.000.
Stoneleigh Trust, The: *See*—
Massa, Frank, 4,433,399, Cl. 367-157.000.
Stram, Oscar B.: *See*—
York, Kenneth L.; and Stram, Oscar B., 4,433,389, Cl. 364-900.000.
Strasser, Bernd: *See*—
Schmitt, Helmut; Schurig, Helmuth; and Strasser, Bernd, 4,432,858, Cl. 204-257.000.
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, to BASF Aktiengesellschaft. Preparation of a polyvinylpyrrolidone by heat treatment of an aqueous solution of a conventional polyvinylpyrrolidone. 4,433,112, Cl. 525-326.900.
Streib, Stephen F., to Chevron Research Company. Ultrasensitive apparatus and method for detecting change in fluid flow during the occurrence of a transient condition. 4,433,329, Cl. 340-606.000.
Streich, Steven G., to Halliburton Company. Retrievable plug. 4,432,419, Cl. 166-188.000.
Streichenberger, Gilles: *See*—
Dumaitre, Bernard; Perrin, Claude; Cornu, Pierre-Jean; and Streichenberger, Gilles, 4,432,984, Cl. 424-267.000.
Streicher, William L.: *See*—
Propster, Mark A.; Hohman, Charles M.; and Streicher, William L., 4,432,780, Cl. 65-2.000.
Streifer, William: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,433,417, Cl. 372-45.000.
Strong, Bruce K.: *See*—
Equitz, Russell E., Jr.; and Strong, Bruce K., 4,432,577, Cl. 294-16.000.
Strudinger, Manfred: *See*—
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, 4,432,772, Cl. 48-66.000.
Stuckmann, Dieter; and Heitkamp, Herbert, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 4,432,665, Cl. 405-143.000.
Stultz, Jeffrey H.: *See*—
Harper, Stephen M.; and Stultz, Jeffrey H., 4,432,913, Cl. 261-97.000.
Suda, Kazuaki: *See*—
Kurosawa, Nobuyuki; and Suda, Kazuaki, 4,433,209, Cl. 381-1.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Hauser, Kurt, 4,432,444, Cl. 192-58.00B.
Sueyoshi, Susumu: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.
Sugahara, Sadanobu, to Yoshida Kogyo K. K. Method of and apparatus for manufacturing slide fastener coupling elements. 4,432,126, Cl. 29-410.000.
Sugise, Ryoji: *See*—
Hamamoto, Toshikazu; and Sugise, Ryoji, 4,433,162, Cl. 560-156.000.
Sugiura, Takeo: *See*—
Sawada, Yoshikatu; Shirakawa, Kazuo; and Sugiura, Takeo, 4,433,043, Cl. 430-175.000.
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, to Victor Company of Japan, Ltd. Apparatus for automatically reproducing signals in accordance with a mode of the recorded signals. 4,433,347, Cl. 358-342.000.
Sugiyama, Iwakichi; Endo, Kiyoshi; and Takaoka, Yukihisa, to Matsumoto Seiyaku Kogyo Kabushiki Kaisha. Room temperature curable silicone compositions. 4,433,127, Cl. 528-17.000.
Sugiyama, Masami; Kasahara, Yasushi; and Ashihara, Yoshihiro, to Fujirebio Kabushiki Kaisha. Derivatives of hippuryl-L-phenylalanine. 4,432,896, Cl. 260-112.50R.
Suiter, Glen H. Adjustable transom brackets and compact self-storing boat ladder. 4,432,436, Cl. 182-97.000.
Sullivan, Donald K.: *See*—
Bland, Gerald F.; and Sullivan, Donald K., 4,432,734, Cl. 440-1.000.
Sullivan, Peter J., to Erad Inc. Fuel for combustion engines. 4,432,308, Cl. 123-1.00A.
Sulzer Brothers Limited: *See*—
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,432,174, Cl. 52-222.000.
Sumitomo Chemical Company, Limited: *See*—
Baba, Kazuo; Kawamata, Shyozo; Fukui, Yoshiharu; Ima, Seiichiro; and Miyatake, Tatsuya, 4,433,110, Cl. 525-323.000.
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,432,908, Cl. 260-465.00D.
Sumitomo Metal Industries, Ltd.: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.
Summers, John E. Compressive cable connector. 4,433,205, Cl. 174-84.00C.
Sundstrand Data Control, Inc.: *See*—
Gradin, James H.; and Joseph, John S., 4,433,344, Cl. 358-181.000.
Grove, Michael M., 4,433,323, Cl. 340-970.000.
Lukes, Henry J., 4,433,301, Cl. 330-109.000.
Sunwa Sharyo Manufacturing Company Limited: *See*—
Misawa, Rintaro, 4,432,426, Cl. 180-8.00A.
Susman, Sherman; Delbecq, Charles J.; Volin, Kenneth J.; and Boehm, Leah, to United States of America, Energy. Glass capable of ionic conduction and method of preparation. 4,432,891, Cl. 252-518.000.
Sutter Biomedical Inc.: *See*—
Christensen, James M.; and Mizoguchi, Allan H., 4,432,361, Cl. 128-419.00F.
Sutton, James B., to Harrison & Jones (Brookside) Limited. Cushioning structure. 4,432,110, Cl. 5-481.000.
Suzuki, Ichiro; Nakagawa, Yasushi; and Kitagawa, Naoto, to Toyota Jidosha Kogyo Kabushiki Kaisha. Steering assembly supporting device of a motor vehicle. 4,432,565, Cl. 280-779.000.
Suzuki, Keizo: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Sakudo, Noriyuki; Ninomiya, Ken; Koike, Hidemi; Okada, Osami; Katagiri, Shinjiro; and Okudaira, Sadayuki, 4,433,228, Cl. 219-10.55R.
Suzuki, Shozo: *See*—
Yamawaki, Maokuni; Suzuki, Shozo; and Furuta, Tadaaki, 4,432,871, Cl. 210-195.100.
Suzuki, Takao: *See*—
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.
Suzuki, Tetsuo: *See*—
Kubo, Yoshimi; Shimizu, Shigeaki; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,432,935, Cl. 419-2.000.
Suzuki, Toshitatsu: *See*—
Kawashima, Ikue; Fukushima, Yoshio; Murano, Tamio; and Suzuki, Toshitatsu, 4,432,622, Cl. 354-408.000.
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Auto-focus built-in camera. 4,432,621, Cl. 354-403.000.
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, to Sumitomo Chemical Company, Limited. Crystal of enantiomer pair of phenylacetic acid ester derivative and process for obtaining a mixture of stereoisomers of the derivative. 4,432,908, Cl. 260-465.00D.

Swain, Douglas S.: *See*—
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.

Swanson, Scott C.: *See*—
Dyer, Robert E.; Swanson, Scott C.; and Hicks, Robert A., 4,433,387, Cl. 364-900.000.

Swart, Gerrit S.; Dauber, Louis S.; and O'Connor, Richard P., to Exxon Research and Engineering Co. Reforming and isomerization process. 4,432,862, Cl. 208-64.000.

Swendeman, Jim M., to Reynolds Metals Company. Can flattener. 4,432,279, Cl. 100-171.000.

Swenson, Robert E.: *See*—
Hanson, Merlin L.; Swenson, Robert E.; and Schmalzbauer, Arnold R., 4,433,374, Cl. 364-200.000.

Swetly, Peter: *See*—
Seliger, Hartmut; Rastl, Eva; and Swetly, Peter, 4,433,140, Cl. 536-27.000.

Swift, Harold E.: *See*—
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,433,197, Cl. 585-823.000.

Swingley, Harold E., Jr., to Menasha Corporation. Reinforced lid construction for security containers or the like. 4,432,467, Cl. 220-334.000.

Swonger, Russell A. Stretcher frame for an artist's canvas. 4,432,150, Cl. 38-102.500.

Sylla, Lancine: *See*—
Lucas, Jean; and Sylla, Lancine, 4,432,342, Cl. 126-418.000.

Symon, Ted; and Engel, Dusan J., to UOP Inc. Purification of cyclohexane. 4,433,194, Cl. 585-803.000.

Syred, Nicholas: *See*—
Parkinson, Michael J.; Jury, Anthony W.; Syred, Nicholas; and Owen, Ieuan, 4,432,778, Cl. 55-212.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, to Richter Gedeon Vegyeszeti Gyar Rt. Polycyclic compounds substituted on the A-ring, pharmaceutical compositions containing them, and methods of treating psoriasis with them. 4,432,982, Cl. 424-256.000.

Szporny, Laszlo: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Szymanski, Chester D., to National Starch and Chemical Corp. Contraceptive composition. 4,432,967, Cl. 424-78.000.

Tabak, Samuel A., to Mobil Oil Corporation. Two stage system for catalytic conversion of olefins with distillate and gasoline modes. 4,433,185, Cl. 585-312.000.

Taber, Louis; and East, Don G., to International Business Machines Corporation. Multichannel common clock. 4,433,424, Cl. 375-106.000.

Tabuchi, Kenji, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 4,432,634, Cl. 355-14.00D.

Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, to Hitachi, Ltd. Hermetic turbo-refrigerator apparatus. 4,432,212, Cl. 62-229.000.

Tachikawa, Hajime; and Ohkawa, Shuji, to Hitachi Heating Appliances Co., Ltd. Heating apparatus. 4,433,232, Cl. 219-502.000.

Tacke, Kenneth L.: *See*—
Larson, Douglas A.; Tacke, Kenneth L.; White, Craig A.; and Paxton, Ronald E., 4,433,011, Cl. 427-231.000.

Tada, Rentaro: *See*—
Narukawa, Hiroshi; Tada, Rentaro; Takeuchi, Yasuhira; and Ohara, Osamu, 4,433,020, Cl. 428-113.000.

Taft, Buckie A., to Steel Research Incorporated. Composite steel and concrete floor construction. 4,432,178, Cl. 52-334.000.

Tagata, Nobuo: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.

Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal sampling gate circuit. 4,433,255, Cl. 307-353.000.

Taisho Pharmaceutical Company, Ltd.: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.

Taiti, Yosio: *See*—
Koizumi, Hideaki; Taiti, Yosio; Moriya, Kazuo; Harada, Katsuhito; and Sato, Kazuo, 4,432,643, Cl. 356-312.000.

Tajima, Osamu: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,432,788, Cl. 75-3.000.

Takagi, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrical insulator with water-repellent oil-bleeding insulation bands. 4,433,203, Cl. 174-30.000.

Takahashi, Hiroyuki: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.

Takahashi, Kouzou: *See*—
Ichinohe, Shoji; Takahashi, Kouzou; and Tanaka, Yasuharu, 4,433,125, Cl. 526-279.000.

Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, to Fuji Photo Film Co., Ltd. Web conveying method and apparatus. 4,432,854, Cl. 204-206.000.

Takahashi, Mineo: *See*—
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.

Takahashi, Toshiaki: *See*—
Itoh, Nobora; Takahashi, Toshiaki; Ogi, Keiji; and Kamitakahara, Atsushi, 4,433,049, Cl. 430-495.000.

Takaoka, Yukihisa: *See*—
Sugiyama, Iwakichi; Endo, Kiyoshi; and Takaoka, Yukihisa, 4,433,127, Cl. 528-17.000.

Takashima, Akio: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, 4,433,109, Cl. 525-314.000.

Takasu, Yasuhito: *See*—
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, 4,432,322, Cl. 123-416.000.

Takata, Isao: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,433,054, Cl. 435-178.000.

Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, to Eisai Co., Ltd. Process for the preparation of 7-(2-amino-2-phenylacetamido) cephem derivatives. 4,433,142, Cl. 544-26.000.

Takayanagi, Motowo; and Murata, Yoshihumi, to Kuraray Co., Ltd. Copolyesteramide and production of the same. 4,433,117, Cl. 525-425.000.

Takeda, Hiroshi: *See*—
Umehara, Kenji; Takeda, Hiroshi; and Tomidokoro, Susumu, 4,432,924, Cl. 264-210.800.

Takeno, Shozo; and Sakamoto, Koichiro, to Tokyo Electric Co. Load cell having thin film strain gauges. 4,432,247, Cl. 73-862.670.

Takeuchi, Yasuhira: *See*—
Narukawa, Hiroshi; Tada, Rentaro; Takeuchi, Yasuhira; and Ohara, Osamu, 4,433,020, Cl. 428-113.000.

Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, to Bridgestone Tire Co., Ltd. Polyisoprene rubber compositions. 4,433,107, Cl. 525-232.000.

Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, to Japan Synthetic Rubber Co., Ltd. Styrene-butadiene block copolymer. 4,433,109, Cl. 525-314.000.

Takuma, Kenzi: *See*—
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,432,908, Cl. 260-465.00D.

Talbot, Richard S., to Richard S. Talbot and Associates. Process for the removal of heavy metals from aqueous solution. 4,432,880, Cl. 210-725.000.

Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Photographic support. 4,433,030, Cl. 428-476.900.

Tamamura, Hideo: *See*—
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,432,621, Cl. 354-403.000.

Tamargo, Anna: *See*—
Pruente, Thomas F.; and Tamargo, Anna, 4,432,522, Cl. 248-215.000.

Tammer, Thomas: *See*—
Knorr, Harald; Handte, Reinhard; Willms, Lothar; and Tammer, Thomas, 4,433,153, Cl. 548-152.000.

Tamura, Hideo; and Ibuki, Seiro, to Kubota Ltd. Process for producing a mixture of tobermorite and ettringite. 4,432,804, Cl. 106-306.000.

Tamura, Sadao: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,433,054, Cl. 435-178.000.

Tanahashi, Toshio: *See*—
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.

Tanaka, Akio, to Fuji Electric Co., Ltd. Coin detecting device for a coin sorting machine. 4,432,447, Cl. 194-100.00A.

Tanaka, Katsumasa: *See*—
Kawakami, Heijiro; Furusawa, Sadayoshi; Hasegawa, Toyofumi; Sato, Hitoshi; Tanaka, Katsumasa; and Koarai, Jiro, 4,432,792, Cl. 75-123.00R.

Tanaka, Ryohei; Kitamura, Akinobu; Odake, Takaaki; and Kato, Yutaka, to Omron Tateisi Electronics, Co. Optical vehicle detection system. 4,433,325, Cl. 340-937.000.

Tanaka, Shinichiro: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,432,318, Cl. 123-339.000.

Tanaka, Takeo: *See*—
Watanabe, Atsuo; Kaneko, Teruo; Tanaka, Takeo; and Saito, Yoshio, 4,432,939, Cl. 422-93.000.

Tanaka, Yasuharu: *See*—
Ichinohe, Shoji; Takahashi, Kouzou; and Tanaka, Yasuharu, 4,433,125, Cl. 526-279.000.

Tanaka, Yasuhide: *See*—
Takayanagi, Keizo; Tanaka, Yasuhide; Kawabata, Tasuke; Nakamura, Fujio; Morita, Yukio; Negi, Shigeto; Kanai, Takeo; and Morita, Eiichi, 4,433,142, Cl. 544-26.000.

Tanner, Olof: *See*—
Andersson, Bengt; and Tanner, Olof, 4,432,825, Cl. 156-307.300.

Tarbox, Bruce H.: *See*—
Lombardo, Ralph M., Jr.; Bradley, John J.; Bruce, Kenneth E.; Conway, John W.; O'Keefe, David B.; and Tarbox, Bruce H., 4,433,376, Cl. 364-200.000.

Tarnowski, Stanley J., to Hoffmann-La Roche Inc. Monomeric interferons. 4,432,895, Cl. 260-112.00R.

Tarsia, Giuseppe, to Berkey Photo, Inc. Illumination apparatus. 4,432,636, Cl. 355-35.000.

Tarsia, Giuseppe, to Berkey Photo, Inc. Alignment structure. 4,432,638, Cl. 355-63.000.

Tarvin, Ronald L.: *See*—
Cunningham, Carole S.; Linser, Charles M.; Resnick, Brian J.; and Tarvin, Ronald L., 4,433,382, Cl. 364-474.000.

Tasco S.p.A.: *See*—
De Gasperi, Mario M.; Racciu, Antonio; and Nari, Dario, 4,433,385, Cl. 364-554.000.

Tassler, Milford C.: *See*—
Hsu, Oscar H. H.; and Tassler, Milford C., 4,433,126, Cl. 527-105.000.

Tate, Takao: *See*—
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.

Tateyama, Masamitsu: *See*—
Kamata, Kazumasa; and Tateyama, Masamitsu, 4,433,103, Cl. 525-81.000.

Tawada, Yoshihisa; Yamamoto, Tetsuro; Ushioda, Minoru; and Saito, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resin talc-embedded composition and method of manufacturing same. 4,433,097, Cl. 524-789.000.

Taylor, Albert J.; and Dykes, Norman L., to United States of America, Energy. Composition and method for brazing graphite to graphite. 4,432,821, Cl. 156-89.000.

Taylor, John B., to Gillette Company, The. Razor and handle coupling means. 4,432,136, Cl. 30-32.000.

Taylor, Larry C.: *See*—
Bellotti, Marc; Laurin, Dean G.; Stauber, Ronald C.; and Taylor, Larry C., 4,432,766, Cl. 604-283.000.

Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Albers, Raymund; and Widder, Hans G., 4,433,213, Cl. 179-18.0FA.
Mannschke, Lothar, 4,432,601, Cl. 350-96.190.

Technical Communications Corporation: *See*—
McCalmont, Arnold M.; and Slate, Matthew W., 4,433,211, Cl. 179-1.50S.

Tegiacchi, Fabio; Chiruzzi, Mario; Casu, Benito; and Torri, Giangiacomo, to Grace Italiana S.p.A. Process for controlled degradation of liquid glucose syrups and cement additive products therefrom. 4,432,801, Cl. 106-92.000.

Teitel, Robert J.; and Solomon, David E., to KMS Fusion, Inc. Process for the fabrication of thermonuclear fuel pellets and the product thereof. 4,432,933, Cl. 376-152.000.

Tempmaster Corporation: *See*—
Dean, Frank J., Jr., 4,432,434, Cl. 181-225.000.

Tendo, Atsushi: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Sekine, Hiroyasu; Tendo, Atsushi; Kikawa, Yoshio; and Kondo, Kaname, 4,433,152, Cl. 546-193.000.

Terasaki, Masatosi: *See*—
Tachibana, Keiji; Terasaki, Masatosi; Nakayama, Yoshihiko; and Kaneko, Junichi, 4,432,212, Cl. 62-229.000.

Terayama, Takao: *See*—
Inoue, Yoichi; Terayama, Takao; Kasai, Susumu; and Tominaga, Tamotsu, 4,432,508, Cl. 242-195.000.

Terentieva, Nina A.: *See*—
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., 4,432,584, Cl. 299-25.000.

Tesch, Gunter, to Breveteam S.A. Method of manufacturing of textile flat structure and textile web manufactured thereby. 4,433,018, Cl. 428-89.000.

Teske, Lothar. Cooling device. 4,432,412, Cl. 165-93.000.

Testco, Inc.: *See*—
Evans, Alyce D.; and Hilty, John R., 4,432,721, Cl. 431-4.000.

Texaco Inc.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,433,176, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., 4,433,177, Cl. 568-487.000.
Lin, Jiang-Jen; and Knifton, John F., 4,433,178, Cl. 568-487.000.
Rice, Doris M.; and Dominguez, Richard J. G., 4,433,067, Cl. 521-51.000.
Zimmerman, Robert L.; and Yeakey, Ernest L., 4,433,170, Cl. 564-508.000.

Textron Inc.: *See*—
Heubusch, Henry P., 4,432,808, Cl. 134-3.000.

Thalmann, Alfred, to Georg Fischer Aktiengesellschaft. Flange connection. 4,432,572, Cl. 285-412.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,432,754, Cl. 604-56.000.
Urquhart, John; and Theeuwes, Felix, 4,432,756, Cl. 604-80.000.

Theml, Thomas: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.

Thermal Systems Limited: *See*—
Fischer, Victor H., 4,432,203, Cl. 60-511.000.

Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast cleaning machine. 4,432,284, Cl. 104-7.00R.

Thomas Electronics, Inc.: *See*—
Seats, Peter; Sanford, Emil; and Waxenbaum, Bernard M., 4,432,464, Cl. 220-2.10A.

Thomas, Gunter: *See*—
Fischer, Helmut; Schafer, Jurgen; and Thomas, Gunter, 4,433,265, Cl. 313-22.000.

Thomas, Jacob E., to NCR Corporation. Ink level control for ink jet printer. 4,433,341, Cl. 346-140.00R.

Thompson, Gordon R., to Petro-Canada Exploration Inc. Method and apparatus for on-line monitoring of bitumen content in tar sand. 4,433,239, Cl. 250-255.000.

Thompson, John A.: *See*—
West, Theodore H.; and Thompson, John A., 4,432,866, Cl. 208-321.000.

Thompson, Kenneth P., to Champion International Corporation. Process for production of polyester-polyolefin film laminates. 4,432,820, Cl. 156-82.000.

Thompson, William L.; and Willey, Michael S., to Babcock & Wilcox Company, The. Tunable notch filter for reducing vibration sensitivity for vortex shedding flowmeter generator. 4,432,242, Cl. 73-861.220.

Thomsen, Svend E.: *See*—
Kyster, Erik; and Thomsen, Svend E., 4,432,270, Cl. 91-436.000.

Thomson-CSF: *See*—
Frebault, Jean Claude, 4,433,292, Cl. 324-404.000.

Thunoda, Masahiro: *See*—
Sakurada, Nobuaki; Kiuchi, Masayoshi; and Thunoda, Masahiro, 4,432,628, Cl. 354-289.120.

Thurber, William E. F., Jr.: *See*—
Denzine, Allen F.; and Thurber, William E. F., Jr., 4,432,883, Cl. 252-12.000.

Tibbets, David W.: *See*—
Sarrell, Ivan D.; Bley, David B.; and Tibbets, David W., 4,432,356, Cl. 128-75.000.

Tighe, Brian J.; and Gee, Howard J., to Kelvin Lenses Limited. Fluorine-containing hydrogel-forming polymeric materials. 4,433,111, Cl. 525-326.200.

TII Corporation: *See*—
Wortman, Donald W., 4,433,215, Cl. 179-170.0NC.

Ting-Ching, Wu. Wrist watch. 4,432,653, Cl. 368-250.000.

Toho Aen Kabushiki Kaisha: *See*—
Kuwayama, Kenta; Nakagawa, Junzo; Tomii, Keishi; and Hagimori, Kenji, 4,432,937, Cl. 420-513.000.

Tojyo, Tetsuo: *See*—
Matsuda, Akira; and Tojyo, Tetsuo, 4,433,105, Cl. 525-211.000.

Tokico, Ltd.: *See*—
Shirakuma, Takashi; Nakamichi, Fujio; and Iguchi, Osamu, 4,432,698, Cl. 417-27.000.

Tokura, Isao: *See*—
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,432,613, Cl. 350-358.000.

Tokyo Electric Co.: *See*—
Takeno, Shozo; and Sakamoto, Koichiro, 4,432,247, Cl. 73-862.670.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aoyagi, Akira; and Ikeda, Shinichi, 4,433,293, Cl. 324-424.000.
Arisato, Junichi, 4,433,268, Cl. 313-440.000.
Inoue, Akihiro; and Kamiya, Akihiro, 4,433,271, Cl. 315-63.000.
Kakegawa, Makoto, 4,432,363, Cl. 128-419.0PS.
Kinoshita, Hiroyuki, 4,433,257, Cl. 307-443.000.
Kobayashi, Hiroshi; Yamada, Hisashi; and Uchida, Yukimasa, 4,432,610, Cl. 350-331.00R.
Kojima, Tadashi, 4,433,415, Cl. 371-37.000.
Kojima, Tadashi, 4,433,416, Cl. 371-37.000.
Mashita, Masao; Yasuda, Nobuaki; Ishibshi, Tomoyuki, deceased; and Ishibashi, Satoshi, legal representative, 4,433,340, Cl. 346-135.100.
Sadamasa, Tetsuo; and Ichikawa, Osamu, 4,432,131, Cl. 29-569.00L.
Saitou, Masao; Iwata, Yasuhiro; and Uchida, Kohachi, 4,432,639, Cl. 355-75.000.
Sano, Tetsu; Yasuzuka, Takezou; Ishiwata, Hisao; and Simizu, Tatsuo, 4,433,230, Cl. 219-118.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,433,255, Cl. 307-353.000.
Takagi, Kunihiko, 4,433,203, Cl. 174-30.000.
Yonezawa, Toshio; and Aoyama, Masaharu, 4,433,004, Cl. 427-38.000.
Yoshida, Shoichi, 4,432,215, Cl. 62-324.600.

Tolles, Walter E. Nephelometer. 4,432,642, Cl. 356-246.000.

Tollner, Earnest W., to University of Georgia, The. Apparatus for simulating soil mechanical impedance on root growth potential. 4,432,233, Cl. 73-432.0SD.

Tomidokoro, Susumu: *See*—
Umehara, Kenji; Takeda, Hiroshi; and Tomidokoro, Susumu, 4,432,924, Cl. 264-210.800.

Tomihira, Shigeru: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,433,107, Cl. 525-232.000.
Tomii, Keishi: *See*—
Kuwayama, Kenta; Nakagawa, Junzo; Tomii, Keishi; and Hagimori, Kenji, 4,432,937, Cl. 420-513.000.
Tominaga, Tamotsu: *See*—
Inoue, Yoichi; Terayama, Takao; Kasai, Susumu; and Tominaga, Tamotsu, 4,432,508, Cl. 242-195.000.
Tomy Corporation: *See*—
Kanno, Hideyuki, 4,432,159, Cl. 46-177.000.
Tong, Kay C., to Northrop Corporation. Beam-rider guidance using two overlapping reticle discs. 4,432,511, Cl. 244-3.130.
Toppan Printing Co., Ltd.: *See*—
Sawada, Yoshikatu; Shirakawa, Kazuo; and Sugiura, Takeo, , 4,433,043, Cl. 430-175.000.
Topper Manufacturing Corporation: *See*—
Schmidt, Detlef E., 4,432,619, Cl. 353-119.000.
Toray Industries, Incorporated: *See*—
Iizuka, Masahiko; Kubota, Hidenobu; and Sano, Emiko, 4,433,052, Cl. 435-68.000.
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, to Hitachi, Ltd. First-in first-out storage and processing unit making use thereof. 4,433,394, Cl. 365-221.000.
Torri, Giangiacomo: *See*—
Tegiacchi, Fabio; Chiruzzi, Mario; Casu, Benito; and Torri, Giangiacomo, 4,432,801, Cl. 106-92.000.
Tosa, Tetsuya: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,433,054, Cl. 435-178.000.
Toth, Anton: *See*—
Kersten, Hilde; Zengel, Hans G.; and Toth, Anton, 4,433,078, Cl. 523-404.000.
Toyo Contact Lens Co., Ltd.: *See*—
Ichinohe, Shoji; Takahashi, Kouzou; and Tanaka, Yasuharu, 4,433,125, Cl. 526-279.000.
Toyo Kogyo Co., Ltd.: *See*—
Kondo, Toshiro; and Hamaoka, Kiyohiko, 4,432,428, Cl. 180-73.00D.
Morita, Yasuyuki; and Oda, Hiroyuki, 4,432,315, Cl. 123-310.000.
Otsuka, Kazutoshi, 4,432,330, Cl. 123-571.000.
Toyo Kohan Co., Ltd.: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hizuka, Kenji; Kunishige, Fumio; and Kondo, Yoshikazu, 4,432,842, Cl. 204-41.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Ito, Kazuo, 4,432,496, Cl. 239-327.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishikawa, Norikatsu; Obata, Haruyuki; Tate, Takao; Tanahashi, Toshio; and Otsuki, Hiromi, 4,432,324, Cl. 123-438.000.
Kawamura, Takahide, 4,432,317, Cl. 123-339.000.
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,432,318, Cl. 123-339.000.
Ogita, Tamotsu, 4,432,316, Cl. 123-328.000.
Saito, Takao, 4,432,210, Cl. 62-126.000.
Suzuki, Ichiro; Nakagawa, Yasushi; and Kitagawa, Naoto, 4,432,565, Cl. 280-779.000.
Tracor BEI, Inc.: *See*—
Smith, Dorsey T.; Bieser, Albert H.; and Kintzinger, Warren H., 4,433,337, Cl. 343-765.000.
Tran, Loi N.: *See*—
Knorr, Raymond S.; Chandler, Joe D.; and Tran, Loi N., 4,433,122, Cl. 526-83.000.
Trane Company, The: *See*—
Hackbart, Reuben J., 4,432,693, Cl. 415-88.000.
Tranoco, Inc.: *See*—
Byars, Larry W., 4,432,550, Cl. 273-169.000.
Transagra Corporation: *See*—
Peer, Herbert R., 4,432,998, Cl. 426-43.000.
Trautmann, Walter: *See*—
Kupper, Friedrich-Wilhelm; Padberg, Gunter; Reichert, Ulrich; and Trautmann, Walter, 4,433,099, Cl. 525-53.000.
Tremmel, Robert A., to OMI International Corporation. Trivalent chromium electroplating baths and processes using thiazole addition agents. 4,432,843, Cl. 204-51.000.
Trinks, Hilmar: *See*—
Eichler, Volker; and Trinks, Hilmar, 4,432,280, Cl. 101-230.000.
Trio Kabushiki Kaisha: *See*—
Ogawa, Atsushi; and Hayashi, Yoshimasa, 4,433,433, Cl. 381-7.000.
Trivedi, Harish S.: *See*—
Jones, William R.; Trivedi, Harish S.; and Gane, Timothy L., 4,433,141, Cl. 544-25.000.
Trivette, Chester D., Jr.: *See*—
Coran, Aubert Y.; and Trivette, Chester D., Jr., 4,433,114, Cl. 525-332.600.
Trodler, Dieter: *See*—
Schmitz, H.-Joachim; Braun, Dieter; Trodler, Dieter; and Cramer, Hugo, 4,432,196, Cl. 57-204.000.
Tronville, Pier G., to Fiat Auto S.p.A. Rear suspension assembly for motor vehicles. 4,432,564, Cl. 280-689.000.
Trutzschler GmbH & Co. KG: *See*—
Rosink, Albert, 4,432,118, Cl. 19-159.00R.
TRW, Inc.: *See*—
Margolin, Mark, 4,432,602, Cl. 350-96.200.
Matlock, Wallace M., 4,432,313, Cl. 123-193.00P.
Tsuchiya, Chikara: *See*—
Honda, Hideo; Tsuchiya, Chikara; Sano, Yoshiaki; Hanazawa, Toshio; and Handa, Harumi, 4,433,306, Cl. 330-297.000.
Tsuchiya, Keiji; Sasaya, Hideaki; and Nara, Akio, to Nippon Soken, Inc. Vane pump with cylinder profile defined by cycloid curves. 4,432,711, Cl. 418-150.000.
Tsuda, Keishiro: *See*—
Harata, Kazuaki; Morimoto, Satoshi; and Tsuda, Keishiro, 4,432,802, Cl. 106-163.00R.
Tsugawa, Shunichi: *See*—
Ogata, Hajime; Ichida, Toshio; Tsugawa, Shunichi; and Irie, Toshio, 4,432,845, Cl. 204-56.00R.
Tsuji, Mahito; Kudo, Toshiyuki; and Itoh, Kazuo, to Sanyo Electric Co., Ltd. Pick-up assembly for video disc player. 4,433,409, Cl. 369-170.000.
Tsukamoto, Masaaki: *See*—
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.
Tsuruta, Masahiko, to Victor Company of Japan, Ltd. Tracking error detection system in a magnetic reproducing apparatus. 4,433,350, Cl. 360-70.000.
Tsutsumi, Fumio: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; and Hattori, Iwakazu, 4,433,109, Cl. 525-314.000.
Tucci, Allan T.: *See*—
Farris, John R.; and Tucci, Allan T., 4,432,302, Cl. 118-410.000.
Tuckey, Charles H., to Walbro Corporation. Fuel pump armature shaft bearing. 4,432,659, Cl. 384-300.000.
Tumelty, Paul F.: *See*—
Gualtieri, Devlin M.; Tumelty, Paul F.; and Gilleo, Mathias A., deceased, 4,433,034, Cl. 428-693.000.
Turner, Norman L., to Varian Associates, Inc. Beam sharing method and apparatus for ion implantation. 4,433,247, Cl. 250-492.200.
Tuzzalino, Costenzio A.: *See*—
Lasak, John L.; and Tuzzalino, Costenzio A., 4,432,663, Cl. 403-275.000.
Tward, Emanuel, to Tward 2001 Limited. Capacitive pressure transducer. 4,432,238, Cl. 73-724.000.
Tward 2001 Limited: *See*—
Tward, Emanuel, 4,432,238, Cl. 73-724.000.
Twyford, Robert H., to Mechanical Enterprises, Inc. Controlled floating contactor switch. 4,433,317, Cl. 335-151.000.
Typpo, Pekka M., to Delphian Corporation. Hydrogen sulfide measuring systems and the like. 4,432,224, Cl. 73-23.000.
Tzodikov, Nathan R., to New England Nuclear Corporation. Organomercurial materials. 4,432,877, Cl. 210-656.000.
UBE Industries, Ltd.: *See*—
Hamamoto, Toshikazu; and Sugise, Ryoji, 4,433,162, Cl. 560-156.000.
Uchida, Kohachi: *See*—
Saitou, Masao; Iwata, Yasuhiro; and Uchida, Kohachi, 4,432,639, Cl. 355-75.000.
Uchida, Yukimasa: *See*—
Kobayashi, Hiroshi; Yamada, Hisashi; and Uchida, Yukimasa, 4,432,610, Cl. 350-331.00R.
Ueda, Makoto: *See*—
Shida, Masaharu; and Ueda, Makoto, 4,433,401, Cl. 368-204.000.
Ueda, Minoru: *See*—
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Exposure light beams control method for use in a picture reproducing machine. 4,432,613, Cl. 350-358.000.
Ueda, Shinjiro: *See*—
Kuroda, Sigeaki; Arai, Akira; Senshu, Takao; Ueda, Shinjiro; Hanada, Masamichi; and Takahashi, Mineo, 4,432,694, Cl. 415-170.00A.
Ueda, Yutaka; and Ikeda, Isamu, to Murata Kikai Kabushiki Kaisha. Method for preventing abnormal splicing in winder. 4,432,197, Cl. 57-261.000.
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,433,046, Cl. 430-385.000.
Ueno, Sadaumi: *See*—
Ohmori, Tsuguharu; and Ueno, Sadaumi, 4,432,535, Cl. 266-239.000.
UHDE GmbH: *See*—
Minning, Rudolf; and Dierkes, Heribert, 4,432,123, Cl. 29-157.00A.
Ujihara, Shin; and Yoshizawa, Takashi, to Nissan Motor Company, Limited. Stretch drawing apparatus. 4,432,222, Cl. 72-350.000.
Ullrich, Kurt: *See*—
Marwitz, Heinrich; Ullrich, Kurt; and Huhn, Karl, 4,433,007, Cl. 427-54.100.
Ulshoefer, Hermann: *See*—
Hasler, Rolf; Henzi, Beat; Schnider, Ernst; and Ulshoefer, Hermann, 4,432,770, Cl. 8-638.000.
Umeda, Hiroyuki: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,432,510, Cl. 242-200.000.
Umehara, Kenji; Takeda, Hiroshi; and Tomidokoro, Susumu, to Lion Corporation. Process for producing an electrically conductive monofilament. 4,432,924, Cl. 264-210.800.

Umezu, Haruo: *See*—
Shirasaka, Yusei; Fuse, Kenichi; and Umezu, Haruo, 4,432,807, Cl. 134-2.000.
Unios Carbide Corporation: *See*—
Brode, George L.; and Chow, Sui-Wu, 4,433,119, Cl. 525-442.000.
Brode, George L.; and Chow, Sui-Wu, 4,433,129, Cl. 528-154.000.
Union Oil Company of California: *See*—
Gowdy, Hugh W.; and Fenton, Donald M., 4,432,962, Cl. 423-573.00R.
Hass, Robert H.; and Ward, John W., 4,432,961, Cl. 423-542.000.
Young, Dean A., 4,433,187, Cl. 585-466.000.
Unisearch Limited: *See*—
Garnett, John L.; Long, Mervyn A.; and Levot, Ronald G., 4,432,889, Cl. 502-5.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Parramore, Thomas S., 4,432,736, Cl. 440-42.000.
United States of America
Agriculture: *See*—
Chen, Peter Y. S.; Helmer, Wayne A.; and Rosen, Howard N., 4,432,147, Cl. 34-46.000.
Air Force: *See*—
Berner, William E.; and Wical, Thomas H., 4,433,198, Cl. 136-230.000.
Boyars, Carl; and Edwards, David J., 4,432,285, Cl. 109-49.500.
Couturier, Guy D., 4,433,438, Cl. 382-41.000.
Dueker, James E.; Foster, Ronald C.; and Whiteson, Bennett V., 4,432,609, Cl. 350-266.000.
Frankel, Milton B.; and Witucki, Edward F., 4,432,815, Cl. 149-19.300.
Frankel, Milton B.; and Witucki, Edward F., 4,432,817, Cl. 149-19.500.
Gowan, John G.; and Shillito, Keith R., 4,433,045, Cl. 430-321.000.
Smith, William E., 4,432,485, Cl. 228-44.10R.
Witucki, Edward F.; and Flanagan, Joseph E., 4,432,814, Cl. 149-19.100.
Army: *See*—
Betts, Robert E.; Williams, Nathan P.; and Stokes, Arnold T., 4,432,202, Cl. 60-221.000.
Manoogian, David V.; Labitt, Bernard H.; and Wood, Joseph R., 4,433,333, Cl. 343-18.00E.
Paquette, Elmer G.; Maloney, Michael J.; Swain, Douglas S.; LaCerte, Richard F.; Peters, James B.; and Mast, Robert E., 4,432,223, Cl. 73-7.000.
Commerce: *See*—
Carr, Alan R., 4,433,336, Cl. 343-728.000.
Energy: *See*—
Brantley, Vanston R.; and Miller, Donald R., 4,432,232, Cl. 73-432.00R.
Hayes, John M.; and Small, Gerald J., 4,432,225, Cl. 73-23.100.
Hurst, Fred J.; Brown, Gilbert M.; and Posey, Franz A., 4,432,945, Cl. 423-10.000.
Lee, Lien-Mow; and Kilpatrick, Lester L., 4,432,893, Cl. 252-631.000.
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,432,902, Cl. 260-239.0HM.
McIntire, William R., 4,432,345, Cl. 126-439.000.
Morgan, Grover D., 4,432,414, Cl. 165-140.000.
Postma, Arlin K., 4,432,777, Cl. 55-86.000.
Susman, Sherman; Delbecq, Charles J.; Volin, Kenneth J.; and Boehm, Leah, 4,432,891, Cl. 252-518.000.
Taylor, Albert J.; and Dykes, Norman L., 4,432,821, Cl. 156-89.000.
Witte, Arvel B., 4,432,286, Cl. 110-193.000.
Health and Human Services: *See*—
DeReggi, Aime' S.; and Harris, Gerald R., 4,433,400, Cl. 367-163.000.
National Aeronautics and Space Administration: *See*—
Banks, Bruce A., 4,432,853, Cl. 204-192.00E.
Nola, Frank J., 4,433,276, Cl. 318-729.000.
Varma, Indra K.; Fohlen, George M.; and Parker, John A., 4,433,115, Cl. 525-417.000.
Navy: *See*—
Green, Geoffrey F.; and Humphrey, James C., 4,432,556, Cl. 277-73.000.
Hislop, Alfred R.; and Rubin, David, 4,433,314, Cl. 333-110.000.
Kennedy, Katherine L.; Proctor, Paul W.; and Dow, Robert L., 4,432,816, Cl. 149-19.300.
Morency, Roger L.; and Olin, Lester D., 4,432,603, Cl. 350-96.210.
Yariv, Amnon; and Winsor, Harry V., 4,433,291, Cl. 324-244.000.
U.S. Philips Corporation: *See*—
David, Guy A. J., 4,433,435, Cl. 381-94.000.
Heytmeijer, Herman R., 4,432,948, Cl. 423-21.500.
Sicignano, Albert; Werkhoven, Christiaan J.; and van der Weg, Werner F., 4,432,810, Cl. 148-1.500.
Van Roosmalen, Johannes H. T.; and De Haas, Franciscus C. M., 4,432,738, Cl. 445-34.000.
United Technologies Corporation: *See*—
Loersch, Joseph F.; and Neal, James W., 4,432,220, Cl. 72-53.000.
Manty, Brian A.; Eckler, Thomas A.; and Fujishiro, Shiro, 4,433,005, Cl. 427-38.000.
University of California, The Regents of the: *See*—
Deutsch, James W., 4,433,058, Cl. 436-504.000.
Lindow, Steven E., 4,432,160, Cl. 47-2.000.
University of Georgia, The: *See*—
Tollner, Earnest W., 4,432,233, Cl. 73-432.05D.
Unterreiner, Ronald C.: *See*—
Graetz, Herbert; and Unterreiner, Ronald C., 4,432,827, Cl. 156-245.000.
UOP Inc.: *See*—
Kulprathipanja, Santi, 4,433,195, Cl. 585-820.000.
Symon, Ted; and Engel, Dusan J., 4,433,194, Cl. 585-803.000.
Uranium Pechiney Ugine Kuhlmann: *See*—
Maurel, Pierre, 4,432,947, Cl. 423-55.000.
Urquhart, John; and Theeuwes, Felix, to Alza Corporation. Apparatus for parenteral infusion of fluid containing beneficial agent. 4,432,754, Cl. 604-56.000.
Urquhart, John; and Theeuwes, Felix, to Alza Corporation. Parenteral controlled therapy. 4,432,756, Cl. 604-80.000.
Usami, Kaoru: *See*—
Ifuku, Naoyuki; Kurokawa, Akio; Seita, Kenzo; Usami, Kaoru; and Aikawa, Naoyuki, 4,433,133, Cl. 528-232.000.
Usami, Kiyoshi: *See*—
Okano, Reijiro; and Usami, Kiyoshi, 4,432,446, Cl. 192-84.00C.
Ushioda, Minoru: *See*—
Tawada, Yoshihisa; Yamamoto, Tetsuro; Ushioda, Minoru; and Saito, Kazuo, 4,433,097, Cl. 524-789.000.
Vaisala Oy: *See*—
Varkia, Esa; and Reittu, Osmo, 4,432,502, Cl. 242-50.000.
Valeo: *See*—
Cadars, Patrick, 4,432,410, Cl. 165-32.000.
Pitoiset, Didier, 4,432,743, Cl. 474-14.000.
Vallet, Philippe M. A.; and Vinot nee Ricol, Annie M. M., to CII Honeywell Bull. Apparatus for converting numeral representing data coding formats received or derived by a central processing unit. 4,433,327, Cl. 340-347.0DD.
Valmet Oy: *See*—
Jarvineva, Elias A., 4,432,515, Cl. 244-123.000.
Vandegraaf, Johannes J., to General Electric Company. Tunable coupling network. 4,433,315, Cl. 333-174.000.
van der Burgt, Maarten J.; Boelema, Sikke J. A.; Schoeber, Willem J. A. H.; and Zuideveld, Pieter L., to Shell Oil Company. Process for the preparation of hydrocarbons from carbon-containing material. 4,433,065, Cl. 518-703.000.
van der Lely, Cornelis. Agricultural tractors and other vehicles. 4,432,427, Cl. 180-24.000.
Vanderpool, Charles C. Non-lethal cock fighting system. 4,432,545, Cl. 273-1.0GC.
Vanderpool, Clarence D.; Scheithauer, Richard A.; and Warmington, Richard G., to GTE Products Corporation. Recovery of refractory metal values from scrap cemented carbide. 4,432,950, Cl. 423-61.000.
van der Weg, Werner F.: *See*—
Sicignano, Albert; Werkhoven, Christiaan J.; and van der Weg, Werner F., 4,432,810, Cl. 148-1.500.
van der Westhuizen, Wynand J.: *See*—
Hopley, Robert J.; and van der Westhuizen, Wynand J., 4,432,422, Cl. 175-61.000.
Van Eenam, Donald N., to Monsanto Company. Viscosity modifiers for acrylamide polymer. 4,433,090, Cl. 524-295.000.
Vanguard Plastics Ltd.: *See*—
Follows, James S., 4,432,523, Cl. 248-250.000.
Van Leirsburg, Dean A.: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,432,949, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,432,953, Cl. 423-140.000.
Van Peteghem, Antoine: *See*—
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,951, Cl. 423-89.000.
De Schepper, Achille; Coussement, Marc; and Van Peteghem, Antoine, 4,432,952, Cl. 423-89.000.
Van Roosmalen, Johannes H. T.; and De Haas, Franciscus C. M., to U.S. Philips Corporation. Camera tube and method of manufacturing same. 4,432,738, Cl. 445-34.000.
van Tilburg, Jan, deceased; by van Tilburg, Yolande Eve, administrator; and by van Tilburg, Roland H., heir. Method and apparatus for imparting two-way properties to flexible webs. 4,432,926, Cl. 264-282.000.
van Tilburg, Jan, deceased; and by van Tilburg, Yolande E., administrator. Creping machine and method. 4,432,927, Cl. 264-282.000.
van Tilburg, Roland H., heir: *See*—
van Tilburg, Jan, deceased; van Tilburg, Yolande Eve, administrator; and van Tilburg, Roland H., heir, 4,432,926, Cl. 264-282.000.
van Tilburg, Yolande E., administrator: *See*—
van Tilburg, Jan, deceased; and van Tilburg, Yolande E., administrator, 4,432,927, Cl. 264-282.000.
van Tilburg, Yolande Eve, administrator: *See*—
van Tilburg, Jan, deceased; van Tilburg, Yolande Eve, administrator; and van Tilburg, Roland H., heir, 4,432,926, Cl. 264-282.000.
Van Zeeland, Anthony J.: *See*—
Larson, Willis A.; and Van Zeeland, Anthony J., 4,433,223, Cl. 200-159.00B.
Varian Associates, Inc.: *See*—
Berrian, Donald W.; and Ward, Billy W., 4,433,384, Cl. 364-525.000.
Muka, Richard S.; and Russo, Carl J., 4,433,246, Cl. 250-492.100.
Turner, Norman L., 4,433,247, Cl. 250-492.200.

Varker, Alan E.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; Clark, William D. K.; and Goodell, Paul D., 4,433,063, Cl. 502-402.000.
Varkia, Esa; and Reittu, Osmo, to Vaisala Oy. Bobbin apparatus for use in radiosondes. 4,432,502, Cl. 242-50.000.
Varlet, Marc F. Latch assembly. 4,432,574, Cl. 292-91.000.
Varma, Indra K.; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Phosphorus-containing imide resins. 4,433,115, Cl. 525-417.000.
Vartanov, Stepan K.; Isupov, Rudolf G.; Malko, Vladimir R.; Mark, Eino A.; Kogan, Boris I.; Belozerov, Aref I.; Morgachev, Ivan I.; Chernik, Jury S.; Kvitkovsky, Konstantin A.; Gusev, Alexei I.; and Terentieva, Nina A., to Leningradskoe Nauchno-Proizvodstvennoe Obiedinenie Zemleroinogo Mashinostroenia. Trenching machine for cutting preferably frozen ground. 4,432,584, Cl. 299-25.000.
Vasishth, Ramesh C.; and Wang, Robert S., to Envirosol Systems International, Ltd. Water based thickened stain. 4,432,797, Cl. 106-34.000.
Veb Gaskombinat Schwarze Pumpe: *See*—
Starke, Joachim; Jakubik, Adolf; Girodi, Erich; Strudinger, Manfred; and Exner, Reinhard, 4,432,772, Cl. 48-66.000.
VEB Kombinat Polygraph "Werner Lamberz": *See*—
Forster, Karl-Heinz, 4,433,426, Cl. 377-2.000.
Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Eichler, Volker; and Trinks, Hilmar, 4,432,280, Cl. 101-230.000.
Venzke, Wilfried: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Vereinigte Edelstahlwerke Aktiengesellschaft: *See*—
Stiebellehner, Johann; and Machner, Peter, 4,432,811, Cl. 148-2.000.
Verhaeg, John: *See*—
Chew, Ivan; and Verhaeg, John, 4,433,355, Cl. 361-172.000.
Vernese, Michael P., to Circle V, Inc. Adjustable livestock chute. 4,432,305, Cl. 119-98.000.
Verschoor, Wouter: *See*—
MacDonald, Leslie R.; and Verschoor, Wouter, 4,432,463, Cl. 217-12.00R.
VFI, Verwertungsgesellschaft fur Industrierueckstande mbH: *See*—
Frey, Rudolf; and Litschke, Peer-Ingo, 4,432,666, Cl. 405-129.000.
Victor Company of Japan, Ltd.: *See*—
Kaneda, Isami; Sakakibara, Susumu; and Sano, Yasushi, 4,433,402, Cl. 369-43.000.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,432,510, Cl. 242-200.000.
Ohtake, Yoshichi, 4,432,626, Cl. 354-155.000.
Saito, Takashi; and Mochizuki, Masafumi, 4,433,405, Cl. 369-77.200.
Saito, Takashi; Mochizuki, Masafumi; and Arai, Norimasa, 4,433,406, Cl. 369-77.200.
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, 4,433,347, Cl. 358-342.000.
Tsuruta, Masahiko, 4,433,350, Cl. 360-70.000.
Viemon, Bernard, to SAFAMA S. A. Apparatus for filling molds carried on a conveyor belt. 4,432,717, Cl. 425-429.000.
Viking Solar Systems, Incorporated: *See*—
Riise, H. Norman; Goranson, George G.; and Karwan, Henry P., 4,432,343, Cl. 126-424.000.
Villamarin, Arturo A.: *See*—
Woodruff, Keith; and Villamarin, Arturo A., 4,432,102, Cl. 4-228.000.
Vinot, Daniel R., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). System for superposition of the successive stages of the transfer of data among several data processing units. 4,433,375, Cl. 364-200.000.
Vinot nee Ricol, Annie M. M.: *See*—
Vallet, Philippe M. A.; and Vinot nee Ricol, Annie M. M., 4,433,327, Cl. 340-347.0DD.
Virgilio, Gustav: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Visky nee Gombos, Zsuzsanna: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.
Voest-Alpine Aktiengesellschaft: *See*—
Kapellner, Arnold, 4,432,588, Cl. 308-234.000.
Scheurecker, Werner; and Spanner, Herbert, 4,432,407, Cl. 164-448.000.
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., to Gulf Research & Development Company. Removing boron trifluoride from coordination compound contaminants in organic liquids. 4,433,197, Cl. 585-823.000.
Vogel, Wilhelm: *See*—
Kuschmierz, Heinz; and Vogel, Wilhelm, 4,432,228, Cl. 73-119.00A.
Vogelgesang, Peter J., to Minnesota Mining and Manufacturing Company. System for reducing phase error in multitrack magnetic recording. 4,433,351, Cl. 360-76.000.
Vogelsang, Klaus, to Voith Turbo GmbH & Co. KG. Hydrodynamic torque-transfer unit, especially a hydrodynamic brake. 4,432,442, Cl. 188-290.000.
Vogelsberg, Dieter: *See*—
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, 4,432,199, Cl. 57-294.000.
Voith Turbo GmbH & Co. KG: *See*—
Vogelsang, Klaus, 4,432,442, Cl. 188-290.000.
Voitsekhovsky, Bogdan V.; and Voitsekhovsky, Mikhail B., to Institut Gidrodinamiki Imeni M.A. Lavrentieva. Wind motor. 4,432,695, Cl. 416-17.000.
Voitsekhovsky, Mikhail B.: *See*—
Voitsekhovsky, Bogdan V.; and Voitsekhovsky, Mikhail B., 4,432,695, Cl. 416-17.000.
Volin, Kenneth J.: *See*—
Susman, Sherman; Delbecq, Charles J.; Volin, Kenneth J.; and Boehm, Leah, 4,432,891, Cl. 252-518.000.
Vollman, Charles K.: *See*—
Scarberry, Walter P.; and Vollman, Charles K., 4,432,826, Cl. 156-244.110.
Vollmeyer, Werner: *See*—
Gefroerer, Stanislaus; and Vollmeyer, Werner, 4,433,411, Cl. 370-80.000.
von Gutfeld, Robert J.: *See*—
Romankiw, Lubomyr T.; and von Gutfeld, Robert J., 4,432,855, Cl. 204-207.000.
von Werner, Konrad, to Hoechst Aktiengesellschaft. Process for the preparation of 2-alkenyl 1,1,2-trifluoro-2-halogenoethyl ethers. 4,433,180, Cl. 568-684.000.
Vrzalik, John H., to Kinetic Concepts, Inc. Kinetic treatment platform. 4,432,353, Cl. 128-24.00R.
Wacker Chemie GmbH: *See*—
Marwitz, Heinrich; Ullrich, Kurt; and Huhn, Karl, 4,433,007, Cl. 427-54.100.
Wada, Satomi, to Aisan Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,432,911, Cl. 261-44.00C.
Wade, Charles E. Pool light mounting structure. 4,433,366, Cl. 362-267.000.
Wagar, Richard L., to Park-Ohio Industries, Inc. Method and apparatus for induction heating of an elongated workpiece. 4,433,226, Cl. 219-10.410.
Wagner, Rudiger: *See*—
Bahn, Michael; Preuss, Wolfgang; Schmid, Rolf; and Wagner, Rudiger, 4,432,905, Cl. 260-397.100.
Wakimura, Kazuo, to Mitsuwa Kogya Co., Ltd. Fishing toy. 4,432,544, Cl. 273-1.00M.
Wakino, Kikuo; and Arakawa, Yoshio, to Murata Manufacturing Co., Ltd. Tubular ceramic capacitor. 4,433,360, Cl. 361-305.000.
Walbro Corporation: *See*—
Tuckey, Charles H., 4,432,659, Cl. 384-300.000.
Walden, John R.: *See*—
Johnson, Phillip L. M.; and Walden, John R., 4,433,396, Cl. 367-105.000.
Walker, Robert G., to Industra Products, Inc. Coil insertion method and apparatus using non-parallel blade gaps. 4,432,400, Cl. 140-92.100.
Wall, Alexander C.; and Sculler, Leonard H., to M & R Seal Press Co., Inc. Self-inking stamping device. 4,432,281, Cl. 101-334.000.
Wallant International Trade, Inc.: *See*—
Russek, Allen S., 4,432,368, Cl. 128-644.000.
Waller, Francis E., to Waller, Leonard J. E. Parallel cylinder internal combustion engine. 4,432,310, Cl. 123-58.0AB.
Waller, Francis J.: *See*—
McLain, Stephan J.; and Waller, Francis J., 4,432,904, Cl. 260-330.600.
Waller, Leonard J. E.: *See*—
Waller, Francis E., 4,432,310, Cl. 123-58.0AB.
Wallman, P. Henrik, to Chevron Research Company. Feed mixing chute and packed bed for pyrolyzing hydrocarbonaceous solids. 4,432,861, Cl. 208-11.00R.
Walsh, Cyral M.: *See*—
Ohannesian, Doru A.; and Walsh, Cyral M., 4,432,568, Cl. 285-3.000.
Walsh, Michael M., to Mechanical Technology Incorporated. Linear hydraulic drive system for a Stirling engine. 4,432,204, Cl. 60-520.000.
Walter, Jurgen, to Hackforth GmbH & Co. KG. Spring steel liquid-damped shaft coupling. 4,432,739, Cl. 464-24.000.
Waluk, Stanley P., to Carol Cable Company, Inc. Electrical lamp socket holder. 4,432,593, Cl. 339-105.000.
Wang, Robert S.: *See*—
Vasishth, Ramesh C.; and Wang, Robert S., 4,432,797, Cl. 106-34.000.
Wannemacher, Willibald: *See*—
Bruderle, Egon U.; and Wannemacher, Willibald, 4,432,672, Cl. 405-268.000.
Ward, Billy W.: *See*—
Berrian, Donald W.; and Ward, Billy W., 4,433,384, Cl. 364-525.000.
Ward, John W.: *See*—
Hass, Robert H.; and Ward, John W., 4,432,961, Cl. 423-542.000.
Waris, Tapio; and Lindroos, Sven-Eric E., to A. Ahlstrom Osakeyhtio. Method and an apparatus for the feeding of a fibre suspension onto the wire of a web former. 4,432,835, Cl. 162-212.000.
Warmington, Richard G.: *See*—
Vanderpool, Clarence D.; Scheithauer, Richard A.; and Warmington, Richard G., 4,432,950, Cl. 423-61.000.

Warren, Paul C., to Bell Telephone Laboratories, Incorporated. Quality control procedure for determining particle concentration in polymers. 4,433,075, Cl. 523-303.000.
Wartian, George, to Wartian Lock Co. Door latch. 4,432,576, Cl. 292-357.000.
Wartian Lock Co.: *See*—
Wartian, George, 4,432,576, Cl. 292-357.000.
Wascat, Raymond, to Bignier Schmid-Laurent. Device for bringing into register the circular end section of a cylindrical element with the circular section of a cylinder bottom, with a view to assembly thereof by welding. 4,432,486, Cl. 228-49.00A.
Wason, Thomas D., to Cain Encoder Co. Apparatus for remotely determining the position of rotating objects. 4,433,332, Cl. 340-870.370.
Watanabe, Atsuo; Kaneko, Teruo; Tanaka, Takeo; and Saito, Yoshio, to Fuji Electric Co., Ltd. Ammonia gas analyzer. 4,432,939, Cl. 422-93.000.
Watanabe, Isamu: *See*—
Morita, Akiro; and Watanabe, Isamu, 4,433,287, Cl. 324-115.000.
Watanabe, Katsumi, to Ozen Corporation. Variety playing sound reproducing device. 4,433,404, Cl. 369-66.000.
Watanuki, Yoshio, to Nissan Motor Company, Limited. Corner cover for a window. 4,432,167, Cl. 49-502.000.
Watari, Yoshie: *See*—
Nishimura, Hiromi; Watari, Yoshie; and Matsubara, Yuusaku, 4,433,357, Cl. 361-196.000.
Wavin B.V.: *See*—
Beune, Joannes H.; and Marissen, Roelof H., 4,432,395, Cl. 138-109.000.
Waxenbaum, Bernard M.: *See*—
Seats, Peter; Sanford, Emil; and Waxenbaum, Bernard M., 4,432,464, Cl. 220-2.10A.
Weaver, Richard L. Silo unloading apparatus. 4,432,687, Cl. 414-307.000.
Weber, Franz K., to Modulite Corporation. Audio light chandelier. 4,433,363, Cl. 362-86.000.
Weber, Giuseppe: *See*—
Cohen, Noal; and Weber, Giuseppe, 4,432,906, Cl. 260-410.90R.
Weber, Walter J., Jr.: *See*—
Bennington, James E.; Bennington, Gerald E.; Bernardin, Frederick E., Jr.; Patterson, Donald J.; and Weber, Walter J., Jr., 4,432,344, Cl. 126-438.000.
Wedler, Klaus, to Croon & Lucke Maschinenfabrik GmbH & Co. KG. Machine for producing yarn loops. 4,432,503, Cl. 242-47.000.
Wei, John S. S., to Northern Telecom Limited. Photoconductor control of electro-optically variable display cell. 4,432,611, Cl. 350-342.000.
Weichel, Bernhard: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.
Weidman, Raymond F.: *See*—
Schneider, Harold N.; Simpson, James H.; and Weidman, Raymond F., 4,433,221, Cl. 200-144.0AP.
Weill, Jerome; Garapon, Jacques; and Sillion, Bernard, to Institut Francais du Petrole. Process for manufacturing anhydrides of alkenyl dicarboxylic acids. 4,433,157, Cl. 549-255.000.
Weimar, Erich, to Draftex Development AG. Trimming or sealing strips. 4,432,166, Cl. 49-491.000.
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., to Restaurant Technology, Inc. Method for preparing scrambled eggs. 4,433,001, Cl. 426-614.000.
Wein, William J.: *See*—
Fehlner, Francis P.; and Wein, William J., 4,432,852, Cl. 204-181.00F.
Weisbord. Leon E.; and Wessbecher, Francis W., to Singer Company, The. Hysteresis synchronous motor utilizing polarized rotor. 4,433,260, Cl. 310-156.000.
Weiss, Hermann: *See*—
Kohler, Gisbert; Weiss, Hermann; and Landwehr, Gotz, 4,432,139, Cl. 30-381.000.
Welch, Willard M.; and Harbert, Charles A., to Pfizer Inc. Hexahydrotrans-pyridoindole. 4,432,978, Cl. 424-249.000.
Welch, William R.; Fisher, Ernest P.; and Yonker, John H., to Otis Engineering Corporation. Well flow control apparatus. 4,432,416, Cl. 166-117.500.
Wellcome Foundation Ltd., The: *See*—
Harris, Clifford J.; and Barraclough, Paul, 4,432,988, Cl. 424-273.00R.
Wellner, Wolfgang: *See*—
Pedain, Josef; Wellner, Wolfgang; Konig, Klaus; and Gruber, Hermann, 4,433,010, Cl. 427-160.000.
Wentworth, Robert J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,432,406, Cl. 160-199.000.
Wentzell, Timothy H.; and Innes, Charles B., Jr., to Combustion Engineering, Inc. Locomotion unit for a tool support adapted for progression through passageways. 4,432,271, Cl. 91-527.000.
Wenzel, Wolfgang: *See*—
Hombach, Rudolf; Reiff, Helmut; Wenzel, Wolfgang; and Dollhausen, Manfred, 4,433,095, Cl. 524-563.000.
Werkhoven, Christiaan J.: *See*—
Sicignano, Albert; Werkhoven, Christiaan J.; and van der Weg, Werner F., 4,432,810, Cl. 148-1.500.
Werner, Ludwig: *See*—
Brundiek, Horst; and Werner, Ludwig, 4,432,500, Cl. 241-57.000.
Werth, Carl H., Jr., to Werth Engineering, Inc. Remote controlled tool arm adjustment. 4,432,259, Cl. 82-2.00E.
Werth Engineering, Inc.: *See*—
Werth, Carl H., Jr., 4,432,259, Cl. 82-2.00E.
Wessbecher, Francis W.: *See*—
Weisbord, Leon E.; and Wessbecher, Francis W., 4,433,260, Cl. 310-156.000.
Wesselhoft, Robert D.: *See*—
Euker, Charles A., Jr.; Wesselhoft, Robert D.; Dunkleman, John J.; Aquino, Dolores C.; and Gouker, Toby R., 4,432,773, Cl. 48-197.00R.
West, Theodore H.; and Thompson, John A., to Exxon Research and Engineering Co. Membrane separation process. 4,432,866, Cl. 208-321.000.
Westerlund, Robert E.; and Read, Wayne L. Concrete pumping swivel coupling apparatus with seal. 4,432,558, Cl. 277-180.000.
Western Digital: *See*—
Leger, Geary L., 4,433,378, Cl. 364-200.000.
Western Electric Company, Inc.: *See*—
Lasak, John L.; and Tuzzalino, Costenzio A., 4,432,663, Cl. 403-275.000.
Westerstrandh, Bjorn V.; and Karlsson, Arne V. Solar collector. 4,432,346, Cl. 126-445.000.
Westfalia Separator AG: *See*—
Icking, Friedrich, 4,432,700, Cl. 417-121.000.
Westinghouse Electric Corp.: *See*—
Caputo, William R.; and Nomura, Masami, 4,432,439, Cl. 187-29.00R.
Gjertsen, Robert K.; Wilson, John F.; and George, Raymond A., 4,432,934, Cl. 376-333.000.
Impink, Albert J., Jr., 4,432,930, Cl. 376-215.000.
Westra, Simon; and Hogervorst, Johannes R., to Shell Oil Company. Suction anchor and method of installing a suction anchor. 4,432,671, Cl. 405-226.000.
Westvaco Corporation: *See*—
Hawes, David H., 4,433,074, Cl. 523-207.000.
Weyerhaeuser Company: *See*—
Muise, Herbert D., 4,432,491, Cl. 229-33.000.
Whirlpool Corporation: *See*—
Kretchman, Gerald L.; and Mason, Anthony, 4,432,528, Cl. 248-603.000.
White, Albert O.: *See*—
Lyons, William C.; and White, Albert O., 4,432,423, Cl. 175-75.000.
White, Bertram: *See*—
Ostrowski, Carl L.; and White, Bertram, 4,433,210, Cl. 381-53.000.
White Consolidated Industries, Inc.: *See*—
Arendash, Joseph M., 4,432,293, Cl. 112-231.000.
White, Craig A.: *See*—
Larson, Douglas A.; Tacke, Kenneth L.; White, Craig A.; and Paxton, Ronald E., 4,433,011, Cl. 427-231.000.
White, Lawrence J.: *See*—
Cook, Paul M.; Otte, Richard F.; Claypool, James L.; White, Lawrence J.; Broyles, Harry C.; and Brooks, Peter L., 4,432,824, Cl. 156-165.000.
Whiteson, Bennett V.: *See*—
Dueker, James E.; Foster, Ronald C.; and Whiteson, Bennett V., 4,432,609, Cl. 350-266.000.
Whitfield, Joyce M.; and Cosper, David R., to Nalco Chemical Company. Additive for felted cellulose fibers. 4,432,834, Cl. 162-158.000.
Wiacek, Marian, to Duracell Inc. Catalytic cathode composition for air-depolarized cell and method of preparation. 4,433,035, Cl. 429-27.000.
Wiatt, James G.; Calvert, James W.; Belcher, Samuel L.; and Smith, Roger D., to Cincinnati Milacron Inc. Apparatus for high rate production of biaxially oriented thermoplastic articles. 4,432,720, Cl. 425-534.000.
Wical, Thomas H.: *See*—
Berner, William E.; and Wical, Thomas H., 4,433,198, Cl. 136-230.000.
Wick, Gerhard, to Akzo NV. Embedding mass based upon fast-reacting polyurethane casting resin. 4,433,128, Cl. 528-53.000.
Widder, Hans G.: *See*—
Albers, Raymund; and Widder, Hans G., 4,433,213, Cl. 179-18.0FA.
Widdowson, Richard E., to General Motors Corporation. Pressure transducer. 4,433,321, Cl. 338-42.000.
Wieder, Irwin; and Wollenberg, Robert H., to Analytical Radiation Corporation. Diamine acid fluorescent chelates. 4,432,907, Cl. 260-429.200.
Wiesmann, Herbert L.; and Becker, Erich W., to Wilkhahn-Wilkening & Hahne GmbH & Company. Chair with means for adjusting the inclination of the backrest. 4,432,582, Cl. 297-316.000.
Wietecha, Robert L., to Air-Mo Hydraulics, Inc. Flexible hose chuck. 4,432,569, Cl. 285-18.000.
Wiezer, Hartmut; and Pfahler, Gerhard, to Hoechst Aktiengesellschaft. Triazine stabilizers. 4,433,145, Cl. 544-198.000.
Wilchek, Meir: *See*—
Gilad, Gad; Gilad, Varda; and Wilchek, Meir, 4,433,051, Cl. 435-7.000.
Wilfert, Thomas: *See*—
Auracher, Gerd; Clement, Albrecht; Daumer, Rolf; Schwarz, Helmut; Theml, Thomas; Venzke, Wilfried; Virgilio, Gustav; Weichel, Bernhard; and Wilfert, Thomas, 4,432,325, Cl. 123-491.000.

Wilgus, Herbert S.: *See—*
Solberg, John C.; Piggin, Roger H.; and Wilgus, Herbert S., 4,433,048, Cl. 430-434.000.

Wilkhahn-Wilkening & Hahne GmbH & Company: *See—*
Wiesmann, Herbert L.; and Becker, Erich W., 4,432,582, Cl. 297-316.000.

Wilkinson, John R., to Bendix Corporation, The. Control system for an internal combustion engine. 4,433,381, Cl. 364-431.050.

Wilkinson, Stanley B., to General Electric Company. Positive sequence undervoltage distance relay. 4,433,353, Cl. 361-80.000.

Willey, Michael S.: *See—*
Thompson, William L.; and Willey, Michael S., 4,432,242, Cl. 73-861.220.

William H. Rorer, Inc.: *See—*
Campbell, Henry F., 4,432,979, Cl. 424-250.000.

William P. Poythress & Company: *See—*
Davis, William M., 4,432,977, Cl. 424-248.500.

Williams, Griffith E. Process for producing extremely low gas and residual contents in metal powders. 4,432,813, Cl. 148-125.000.

Williams, Haydn W. R.: *See—*
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,432,992, Cl. 424-274.000.

Williams, Joseph J.: *See—*
Koppel, Paul E.; Williams, Joseph J.; and Woebcke, Herman N., 4,433,193, Cl. 585-752.000.

Williams, Nathan P.: *See—*
Betts, Robert E.; Williams, Nathan P.; and Stokes, Arnold T., 4,432,202, Cl. 60-221.000.

Williamson, Michael, to Owens-Corning Fiberglas Corporation. Electrode purge sleeve for glass melting furnaces. 4,433,419, Cl. 373-37.000.

Willis, Brian J.; and Eilerman, Robert G., to Fritzsche, Dodge & Olcott, Inc. Substituted cyclohexane derivatives. 4,432,378, Cl. 131-277.000.

Willis, Robert J.: *See—*
Giles, David P.; Kerry, John C.; Kozlik, Antonin; Palmer, Bryan H.; Shutler, Stephen W.; and Willis, Robert J., 4,432,994, Cl. 424-300.000.

Willms, Lothar: *See—*
Knorr, Harald; Handte, Reinhard; Willms, Lothar; and Tammer, Thomas, 4,433,153, Cl. 548-152.000.

Wilson, James E.: *See—*
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,432,340, Cl. 126-390.000.

Wilson, John F.: *See—*
Gjertsen, Robert K.; Wilson, John F.; and George, Raymond A., 4,432,934, Cl. 376-333.000.

Wilzbach, Bernard L.: *See—*
Clark, William D.; Garner, Mark D.; Rhodes, John H., Jr.; and Wilzbach, Bernard L., 4,432,541, Cl. 271-251.000.

Wind, David W., to Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Locating device. 4,433,335, Cl. 343-463.000.

Windebank, Robert W., to Firing Circuits, Inc. Method and apparatus for testing a battery. 4,433,294, Cl. 324-426.000.

Winderlich, Hans-Georg: *See—*
Stockburger, Hermann; and Winderlich, Hans-Georg, 4,432,567, Cl. 283-83.000.

Windmoller & Holscher: *See—*
Feldkamper, Richard, 4,432,686, Cl. 414-77.000.

Windsor, Harry M., to Automotive Products Limited. Clutch control systems. 4,432,445, Cl. 192-0.076.

Wineland, Richard D. Cervical traction kit. 4,432,352, Cl. 128-17.000.

Winkler, Heinrich: *See—*
Herklotz, Helmut; Mehler, Gunter; Neulinger, Franz; Schummer, Helmut; Daar, Horst; Schmidt, Walter; and Winkler, Heinrich, 4,433,281, Cl. 323-246.000.

Winkler, Ottmar, to SKF Kugellagerfabriken GmbH. Joint means for transmitting a moment of rotation in both directions. 4,432,741, Cl. 464-145.000.

Winsor, Harry V.: *See—*
Yariv, Amnon; and Winsor, Harry V., 4,433,291, Cl. 324-244.000.

Wirsbinski, James L., to J. I. Case Company. Self-elevating wood splitter. 4,432,402, Cl. 144-193.00A.

Withers, L. Andrew, Jr.; Withers, William D.; and Fineo, Carlo, to Withers, L. Andrew, Jr. Support block assembly. 4,432,526, Cl. 248-542.000.

Withers, William D.: *See—*
Withers, L. Andrew, Jr.; Withers, William D.; and Fineo, Carlo, 4,432,526, Cl. 248-542.000.

Witte, Arvel B., to United States of America, Energy. Combustion pinhole camera system. 4,432,286, Cl. 110-193.000.

Witucki, Edward F.; and Flanagan, Joseph E., to United States of America, Air Force. Azido esters. 4,432,814, Cl. 149-19.100.

Witucki, Edward F.: *See—*
Frankel, Milton B.; and Witucki, Edward F., 4,432,815, Cl. 149-19.300.
Frankel, Milton B.; and Witucki, Edward F., 4,432,817, Cl. 149-19.500.

Wize, Gary A., to General Motors Corporation. Three point seat adjuster. 4,432,524, Cl. 248-395.000.

Woebcke, Herman N.: *See—*
Koppel, Paul E.; Williams, Joseph J.; and Woebcke, Herman N., 4,433,193, Cl. 585-752.000.

Woerner, Leo G.: *See—*
Phillips, Martha E.; and Woerner, Leo G., 4,432,661, Cl. 403-172.000.

Wolf, Franz-Josef; and Klaschka, Rudolf. Cover with electrically insulated current conduction. 4,433,361, Cl. 361-433.000.

Wolf, Fred: *See—*
Dzyck, Wolfgang; Hoppe, Bernd; Loczenski, Martin; Vogelsberg, Dieter; and Wolf, Fred, 4,432,199, Cl. 57-294.000.

Wolf, Jerrold M. Tent stake. 4,432,382, Cl. 135-118.000.

Wollenberg, Robert H.: *See—*
Wieder, Irwin; and Wollenberg, Robert H., 4,432,907, Cl. 260-429.200.

Wollman, Jack, to Bulova Watch Company, Inc. Integrated watch case and bracelet assembly. 4,432,655, Cl. 368-282.000.

Wolsing, Wilhelm: *See—*
Musall, Reimar; and Wolsing, Wilhelm, 4,432,943, Cl. 422-179.000.

Won, Vann Y. Method and apparatus for separating a substance from a liquid. 4,432,775, Cl. 55-41.000.

Wong, Rayman Y., to Stauffer Chemical Company. Amine oxanilic acid salts as herbicide extenders. 4,432,909, Cl. 260-501.110.

Wood, Joseph R.: *See—*
Manoogian, David V.; Labitt, Bernard H.; and Wood, Joseph R., 4,433,333, Cl. 343-18.00E.

Woodford Manufacturing Company: *See—*
Breneman, Warren R., 4,432,692, Cl. 414-749.000.

Wooding: *See—*
Wooding, Patrick J., 4,433,421, Cl. 373-79.000.

Wooding, Patrick J., to Wooding. Controlled atmosphere melting of molten slag charge. 4,433,421, Cl. 373-79.000.

Woodruff, Keith; and Villamarin, Arturo A., to American Cyanamid Co. Dispensing package for automatically releasing a controlled amount of an additive solution into a water tank and bowl. 4,432,102, Cl. 4-228.000.

Woodward, Fred E.; and Hudson, Alice. Ionomers as antistatic agents. 4,433,113, Cl. 525-327.500.

Worley, Ronald W.; and Johnson, David A., to Akzona Incorporated. Method for the prevention of hydrolysis of polyesterification catalysts. 4,433,135, Cl. 528-282.000.

Wortman, Donald W., to TII Corporation. Solid state hybrid circuits. 4,433,215, Cl. 179-170.0NC.

Woste, Ludger, to Lexel Corporation. Nozzle for forming a free jet stream of a liquid, and its method of manufacture. 4,432,497, Cl. 239-589.000.

Wrasidlo, Wolfgang J.; and Mysels, Karol J., to Brunswick Corporation. Semi-permeable membranes and processes for making the same. 4,432,875, Cl. 210-500.200.

Wright, Danny O.: *See—*
Carp, Ralph W.; and Wright, Danny O., 4,433,390, Cl. 364-900.000.

Wright, Felix W., to A.P.V. Company Limited, The. Plate heat exchanger. 4,432,415, Cl. 165-166.000.

Wright, Howard, to Burundy, Inc. Means for mounting cables and the like. 4,432,519, Cl. 248-49.000.

Wuertz, Emil S., to Harvey Hubbell Incorporated. Fire rated closure plug. 4,432,465, Cl. 220-235.000.

Wuertz, Emil S., to Harvey Hubbell Incorporated. Junction box for poke-thru floor fittings. 4,433,204, Cl. 174-48.000.

Wurzer, Ernst, to Mauser-Werke GmbH. Extrusion head. 4,432,718, Cl. 425-466.000.

Wyatt, Gerald A., to Minnesota Mining and Manufacturing Company. Control circuit for transformer relay. 4,433,356, Cl. 361-191.000.

Xerox Corporation: *See—*
Badesha, Santokh S.; Smith, Thomas W.; and Loutfy, Rafik O., 4,432,841, Cl. 204-14.00N.
Buchheit, Robert F., 4,433,297, Cl. 324-457.000.
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,433,417, Cl. 372-45.000.
Stoffel, James C.; Seachman, Ned J.; Hauber, Jack R.; and Kingsley, William, 4,433,346, Cl. 358-293.000.

Yaji, Motoyasu: *See—*
Shimizu, Masuto; Morimoto, Tadashi; Yaji, Motoyasu; Tsukamoto, Masaaki; Suzuki, Takao; and Ogura, Shigeru, 4,432,533, Cl. 266-44.000.

Yale Security Products Ltd.: *See—*
Chew, Ivan; and Verhaeg, John, 4,433,355, Cl. 361-172.000.

Yamada, Hisashi: *See—*
Kobayashi, Hiroshi; Yamada, Hisashi; and Uchida, Yukimasa, 4,432,610, Cl. 350-331.00R.

Yamada, Mitsuhiko: *See—*
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,432,613, Cl. 350-358.000.

Yamada, Motoyuki: *See—*
Okamoto, Haruo; and Yamada, Motoyuki, 4,432,781, Cl. 65-18.200.

Yamaga, Hiroyoshi: *See—*
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Yamagishi, Youji: *See—*
Hamamura, Kimio; Akasaka, Kozo; and Yamagishi, Youji, 4,433,159, Cl. 549-411.000.

Yamaguchi, Takashi: *See—*
Stahler, John A.; and Yamaguchi, Takashi, 4,432,230, Cl. 73-168.000.

Yamamiya, Kazuo: *See—*
Miyamoto, Akira; Shimizu, Senzo; Yamamiya, Kazuo; and Harada, Masahiro, 4,433,136, Cl. 528-347.000.

Yamamoto, Kazuyoshi; and Sato, Tadashi, to Caterpillar Mitsubishi Limited. Shoe bolt securing and removing apparatus. 4,432,257, Cl. 81-464.000.

Yamamoto, Keisuke: *See*—
Iyehara, Sadahiro; Kawashima, Kazumi; Ueda, Minoru; Yamamoto, Keisuke; Hosokawa, Tatsuhiro; and Furuta, Yukio, 4,433,395, Cl. 365-222.000.

Yamamoto, Tetsuro: *See*—
Tawada, Yoshihisa; Yamamoto, Tetsuro; Ushioda, Minoru; and Saito, Kazuo, 4,433,097, Cl. 524-789.000.

Yamanashi, Teruaki: *See*—
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, 4,433,098, Cl. 524-811.000.

Yamasa Shoyu Kabushiki Kaisha: *See*—
Nakatsugawa, Shigekazu, 4,432,348, Cl. 128-1.100.

Yamasaki, Masafumi; and Yoshida, Muneaki, to Olympus Optical Co., Ltd. Automatic exposure control camera. 4,432,623, Cl. 354-412.000.

Yamashita, Keitaro, to Hitachi Metals, Ltd. Recording method. 4,433,041, Cl. 430-122.000.

Yamashita, Tadaoki: *See*—
Baba, Sueki; Yoshida, Tomio; Akahira, Nobuo; and Yamashita, Tadaoki, 4,433,403, Cl. 369-48.000.

Yamawaki, Maokuni; Suzuki, Shozo; and Furuta, Tadaaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Immune adsorbent, adsorbing device and blood purifying apparatus. 4,432,871, Cl. 210-195.100.

Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,433,275, Cl. 318-578.000.

Yamazoe, Hiroshi: *See*—
Azuma, Koichi; Nagasawa, Masahiro; Yamazoe, Hiroshi; and Aoki, Masaki, 4,433,408, Cl. 369-170.000.

Yanagawa, Hitoshi: *See*—
Shirai, Masanari; and Yanagawa, Hitoshi, 4,432,509, Cl. 242-195.000.

Yang, Kang; and Reedy, James D., to Conoco Inc. Color precursor removal from detergent range alkyl benzenes. 4,433,196, Cl. 585-823.000.

Yano, Kunihiko. Method for predicting properties of a chemical compound. 4,432,732, Cl. 434-298.000.

Yariv, Amnon; and Winsor, Harry V., to United States of America, Navy. Optical fiber for magnetostrictive responsive detection of magnetic fields. 4,433,291, Cl. 324-244.000.

Yasuda, Nobuaki: *See*—
Mashita, Masao; Yasuda, Nobuaki; Ishibshi, Tomoyuki, deceased; and Ishibashi, Satoshi, legal representative, 4,433,340, Cl. 346-135.100.

Yasuhara, Seishi, to Nissan Motor Company, Limited. Fuel injection control system for a fuel injection pump. 4,432,319, Cl. 123-357.000.

Yasuhara, Seishi, to Nissan Motor Company, Limited. Engine control system. 4,432,331, Cl. 123-571.000.

Yasunaka, Masayoshi: *See*—
Kabu, Yasunori; Yasunaka, Masayoshi; Morita, Yoshinori; and Motowoka, Masanori, 4,433,121, Cl. 526-68.000.

Yasuzuka, Takezou: *See*—
Sano, Tetsu; Yasuzuka, Takezou; Ishiwata, Hisao; and Simizu, Tatsuo, 4,433,230, Cl. 219-118.000.

Yatsuhashi, Kiyomi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.

Yazawa, Toshinari: *See*—
Matsuo, Sachio; Sakane, Tadashi; Noumi, Ryoichi; Fujiwara, Shinji; Fukudome, Hiroshi; Kobashi, Rikizo; Izaiku, Hiroumi; and Yazawa, Toshinari, 4,432,851, Cl. 204-181.00R.

Yeakey, Ernest L.: *See*—
Zimmerman, Robert L.; and Yeakey, Ernest L., 4,433,170, Cl. 564-508.000.

Yeda Research and Development Co., Ltd.: *See*—
Gilad, Gad; Gilad, Varda; and Wilchek, Meir, 4,433,051, Cl. 435-7.000.

Yerkes, John W.: *See*—
Jester, Theresa L.; Yerkes, John W.; Gay, Charles F.; and Bottenberg, William R., 4,433,200, Cl. 136-251.000.

Yodis, John: *See*—
Laganis, Deno; and Yodis, John, 4,433,080, Cl. 523-414.000.

Yokogawa Hokushin Electric Corporation: *See*—
Nakagawa, Shuichi; Tamura, Sadao; Satoh, Setsuo; Sanagi, Mamoru; Otsu, Hirosho; Miyamoto, Shigenobu; and Takahashi, Hiroyuki, 4,433,338, Cl. 346-34.000.

Yokosuka, Koichi, to Seiko Instruments & Electronics Ltd. Band attachment assembly for attaching a watchband to a watchcase. 4,432,476, Cl. 224-164.000.

Yokota, Takashi, to Ricoh Company, Ltd. Apparatus for holding a recording member in the form of an endless belt in a recording system using same. 4,432,632, Cl. 355-3.0DD.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Power supply changeover type power amplifier. 4,433,307, Cl. 330-297.000.

Yonezawa, Toshio; and Aoyama, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and a method for manufacturing the same. 4,433,004, Cl. 427-38.000.

Yonker, John H.: *See*—
Welch, William R.; Fisher, Ernest P.; and Yonker, John H., 4,432,416, Cl. 166-117.500.

York, Kenneth L.; and Stram, Oscar B., to Burroughs Corporation. Memory address translation system for accessing memory locations via job names. 4,433,389, Cl. 364-900.000.

Yoshida, Eiichi: *See*—
Morikawa, Yonekichi; Shimizu, Toshio; Yoshida, Eiichi; Konagaya, Tsuyoshi; and Hirayama, Keizo, 4,433,229, Cl. 219-84.000.

Yoshida Kogyo K. K.: *See*—
Sugahara, Sadanobu, 4,432,126, Cl. 29-410.000.

Yoshida, Muneaki: *See*—
Yamasaki, Masafumi; and Yoshida, Muneaki, 4,432,623, Cl. 354-412.000.

Yoshida, Shoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Pressure differential automatic transfer type three-way valves. 4,432,215, Cl. 62-324.600.

Yoshida, Tomio: *See*—
Baba, Sueki; Yoshida, Tomio; Akahira, Nobuo; and Yamashita, Tadaoki, 4,433,403, Cl. 369-48.000.

Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, 4,433,347, Cl. 358-342.000.

Yoshikawa, Kensei: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ishiguro, Michihiro; Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,433,160, Cl. 560-56.000.

Yoshikoshi, Hideyuki: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,432,788, Cl. 75-3.000.

Yoshioka, Mitsuru: *See*—
Ogawa, Yasunao; Noto, Akira; Mori, Sachio; and Yoshioka, Mitsuru, 4,433,139, Cl. 536-17.200.

Yoshizawa, Takashi: *See*—
Ujihara, Shin; and Yoshizawa, Takashi, 4,432,222, Cl. 72-350.000.

Yost, Paul E. Gas-proof fastening system for a non-rigid airship. 4,432,513, Cl. 244-99.000.

Young, Dean A., to Union Oil Company of California. Process for selectively producing para-xylene. 4,433,187, Cl. 585-466.000.

Young, Lewis B., to Mobil Oil Corporation. Catalytic conversion of methanol to light olefins. 4,433,189, Cl. 585-640.000.

Young, Robert W., to British Aerospace Public Limited Company. Jet propulsion efflux outlets. 4,432,512, Cl. 244-3.220.

Young, Steven A.: *See*—
Buyalos, Edward J.; Rowan, Hugh H.; and Young, Steven A., 4,432,940, Cl. 422-135.000.

Young, Uen-Long: *See*—
Liau, Shung-Chung; Cheng, Wei-Min; and Young, Uen-Long, 4,432,840, Cl. 204-14.00N.

Yui, Hiroshi: *See*—
Sano, Hironari; and Yui, Hiroshi, 4,433,073, Cl. 523-201.000.

Yumino, Masamichi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,433,305, Cl. 330-296.000.

Yusa, Yasuhiro: *See*—
Sugiyama, Hiroyuki; Yoshihara, Kenji; Yusa, Yasuhiro; Abe, Ryozo; and Sakurai, Masaki, 4,433,347, Cl. 358-342.000.

Yuta, Kenji: *See*—
Niimura, Isao; Imagome, Hiroshi; Yamaga, Hiroyoshi; Akuzawa, Noboru; Yuta, Kenji; and Kurahashi, Takeo, 4,433,040, Cl. 430-109.000.

Zajer nee Balazs, Mari: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Zajer nee Balazs, Mari; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,432,982, Cl. 424-256.000.

Zajic, James E.; and Cooper, David G. De-emulsification agents of microbiological origin. 4,432,887, Cl. 252-331.000.

Zandona, Oliver J.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,432,890, Cl. 502-62.000.
Myers, George D., deceased; Hettinger, William P., Jr.; Kovach, Stephen M.; and Zandona, Oliver J., 4,432,863, Cl. 208-113.000.

Zanetta, Hugues; and Richard, Daniel, to Institut de Recherches de la Siderurgie Francaise. Oxygen lance for steel converter. 4,432,534, Cl. 266-225.000.

Zapisek, John M., to Standard Microsystems Corporation. Three-phase regulated high-voltage charge pump. 4,433,253, Cl. 307-297.000.

Zarzycki, Jerzy W.; Prassas, Michel; and Phalippou, Jean E. H., to Corning France. Preparation of monolithic silica aerogels, the aerogels thus obtained and their use for the preparation of silica glass articles and of heat-insulating materials. 4,432,956, Cl. 423-338.000.

Zauer, Karoly: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Visky nee Gombos, Zsuzsanna; and Barta nee Szalai, Gizella, 4,432,901, Cl. 260-239.00A.

Zaugg, Edmond, to Montres Rolex S.A. Process and apparatus for determining the state of charge of a battery. 4,433,295, Cl. 324-429.000.

Zebelean, John, to Pro-Pattern, Inc. Metal golf driver. 4,432,549, Cl. 273-167.00H.

Zeitoun, Paul; and Brisard, Patrick, to Roussel-UCLAF. Compressed tablets for disintegration in the colon comprising an active ingredient containing nucleus coated with a first layer containing microcrystalline cellulose which is coated with an enteric organic polymer coating. 4,432,966, Cl. 424-21.000.

Zekert, Gerhard C.; and DeArment, Donald K., to Nabisco Brands, Inc. Nut blanching apparatus. 4,432,275, Cl. 99-625.000.

Zengel, Hans G.: *See*—
Kersten, Hilde; Zengel, Hans G.; and Toth, Anton, 4,433,078, Cl. 523-404.000.

Zeppelzauer, Wolfgang: *See*—
Theurer, Josef; Folser, Karl; Riessberger, Klaus; Zeppelzauer, Wolfgang; and Glawischnig, Wilfried, 4,432,284, Cl. 104-7.00R.
Zilch, Karl T., to Emery Industries, Inc. Process for raisin production. 4,433,002, Cl. 426-640.000.
Zimmerman, Robert L.; and Yeakey, Ernest L., to Texaco Inc. Novel bis(aminoethyl)ether derivatives useful as polyurethane catalysts. 4,433,170, Cl. 564-508.000.
Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,433,149, Cl. 546-21.000.
Zuideveld, Pieter L.: *See*—
van der Burgt, Maarten J.; Boelema, Sikke J. A.; Schoeber, Willem J. A. H.; and Zuideveld, Pieter L., 4,433,065, Cl. 518-703.000.
501 Control Data Canada, Ltd.: *See*—
Maki, Melvin C., 4,432,193, Cl. 57-3.000.
501 Hellige GmbH: *See*—
Leist, Helmut, 4,432,365, Cl. 128-635.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF FEBRUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Hoebel, Peter, to Siemens Aktiengesellschaft. Apparatus for the detection and processing of electric signals. Re. 31,524, Cl. 307-149.000.

Siemens Aktiengesellschaft: *See*—
Hoebel, Peter, Re. 31,524, Cl. 307-149.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bio-Energy Systems, Inc.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,349,070, Cl. 165-173.000.

Coe Manufacturing Co.: *See*—
Kerr, James R., B1 3,671,726, Cl. 364-563.000.

Fuentes, Jose C.; and Marin, Ramon X., to Guanos y Fertilizantes de Mexico, S.A. Process for reducing the biuret content in urea. B1 3,903,158, 2-21-84, Cl. 564-073.000.

General Electric Company: *See*—
Wambach, Allen D., B1 4,123,415, Cl. 524-451.000.

Guanos y Fertilizantes de Mexico, S.A.: *See*—
Fuentes, Jose C.; and Marin, Ramon X., B1 3,903,158, Cl. 564-073.000.

Kerr, James R., to Coe Manufacturing Co. Electro-optical apparatus for precise on-line measurement of the thickness of moving strip material. B1 3,671,726, 2-21-84, Cl. 364-563.000.

Krulick, Steven E.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,349,070, Cl. 165-173.000.

Leonard, Ronald W.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,349,070, Cl. 165-173.000.

Marin, Ramon X.: *See*—
Fuentes, Jose C.; and Marin, Ramon X., B1 3,903,158, Cl. 564-073.000.

Wambach, Allen D., to General Electric Company. Reinforced thermoplastic polyester compositions having improved resistance to heat deflection. B1 4,123,415, 2-21-84, Cl. 524-451.000.

Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., to Bio-Energy Systems, Inc. Tube mat heat exchanger. B1 4,349,070, 2-21-84, Cl. 165-173.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Larkin, Mark E., 272,725, Cl. D9-435.000.
Tanner, John C., II, 272,762, Cl. D24-58.000.

ACE Orthopedic Manufacturing, Inc.: *See*—
Dohogne, Charles L., 272,764, Cl. D24-33.000.

AGFA-Gevaert AG: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 272,744, Cl. D16-34.000.

Aktiebolaget Wicanders Korkfabriker: *See*—
Nemeth, Josef, 272,767, Cl. D25-80.000.

Allen, Steven R. Combined slide hammer nail puller and building wrecking tool. 272,712, 2-21-84, Cl. D8-89.000.

American Drew Division of Sperry and Hutchinson Furniture, Inc.: *See*—
Aulbert, Harold V.; and Horton, Charles M., 272,698, Cl. D6-154.000.

American Home Products Corporation: *See*—
Baker, Robert, 272,723, Cl. D9-377.000.

AMP Incorporated: *See*—
Cosmos, Pete; and McCleerey, Earl W., 272,733, Cl. D13-24.000.

Antonick, Milton J.; and Thorwaldsen, Stanley E., to Thor Power Tool Company. Paving breaker. 272,710, 2-21-84, Cl. D8-67.000.

Atherton, Henry. Power tool for laminate trimming and edge finishing. 272,709, 2-21-84, Cl. D8-67.000.

Atlas Copco Aktiebolag: *See*—
Gidlund, Per A. L.; and Wedlin, Per G., 272,708, Cl. D8-61.000.

Aulbert, Harold V.; and Horton, Charles M., to American Drew Division of Sperry and Hutchinson Furniture, Inc. Dresser or the like. 272,698, 2-21-84, Cl. D6-154.000.

Avantgarde S.p.A.: *See*—
Stocchi, Gabriele, 272,679, Cl. D4-25.000.
Stocchi, Gabriele, 272,680, Cl. D4-25.000.
Stocchi, Gabriele, 272,681, Cl. D4-25.000.
Stocchi, Gabriele, 272,682, Cl. D4-25.000.
Stocchi, Gabriele, 272,683, Cl. D4-25.000.
Stocchi, Gabriele, 272,684, Cl. D4-25.000.
Stocchi, Gabriele, 272,685, Cl. D4-25.000.
Stocchi, Gabriele, 272,686, Cl. D4-25.000.
Stocchi, Gabriele, 272,687, Cl. D4-25.000.
Stocchi, Gabriele, 272,688, Cl. D4-25.000.
Stocchi, Gabriele, 272,689, Cl. D4-25.000.
Stocchi, Gabriele, 272,690, Cl. D4-25.000.
Stocchi, Gabriele, 272,691, Cl. D4-25.000.

Bailey, Wilbur J., to Stanley Works, The. Child safety latch. 272,715, 2-21-84, Cl. D8-331.000.

Baker, Robert, to American Home Products Corporation. Bottle or the like. 272,723, 2-21-84, Cl. D9-377.000.

Balaban, David B.: *See*—
Bienwald, Wolfgang F.; and Balaban, David B., 272,734, Cl. D13-32.000.

Baldwin Piano & Organ Company: *See*—
Kimble, Thomas E., 272,746, Cl. D17-6.000.

Ball Corporation: *See*—
Haag, John H., Sr., 272,768, Cl. D34-38.000.

Beirise, Jean M.: *See*—
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., 272,737, Cl. D14-68.000.

Benjamin & Medwin, Inc.: *See*—
Miller, David W., 272,703, Cl. D7-43.000.

Best, Melvin H. M., to Teradata Corporation. Console for data processing equipment. 272,738, 2-21-84, Cl. D14-102.000.

Bidegain, Pierre, to Bidegain S.A. Shoe sole. 272,675, 2-21-84, Cl. D2-320.000.

Bidegain S.A.: *See*—
Bidegain, Pierre, 272,675, Cl. D2-320.000.

Bienwald, Wolfgang F.; and Balaban, David B., to Leviton Manufacturing Company, Inc. Switch. 272,734, 2-21-84, Cl. D13-32.000.

Boudreaux, Mark D., to CPG Products Corp. Toy space vehicle. 272,752, 2-21-84, Cl. D21-87.000.

Bove, Steven C.; and Garelick, Herbert J. Walking cane. 272,677, 2-21-84, Cl. D3-9.000.

Brackmann, Rogers F., to H,H&B, Inc. Aerial toy. 272,751, 2-21-84, Cl. D21-86.000.

Brewer, John H. Golf grip aid. 272,754, 2-21-84, Cl. D21-234.000.

Bridgestone Tire Company Limited: *See—*
Osawa, Tooru; and Kojima, Hiroshi, 272,730, Cl. D12-147.000.
Buis, Richard D.: *See—*
Moore, Brian E.; and Buis, Richard D., 272,732, Cl. D13-13.000.
Carlson Dolls Co.: *See—*
Carlson, Lowell J., 272,753, Cl. D21-153.000.
Carlson, Lowell J., to Carlson Dolls Co. Hand puppet. 272,753, 2-21-84, Cl. D21-153.000.
Claman, Mike T. Chair. 272,693, 2-21-84, Cl. D6-57.000.
Claman, Mike T. Rocking chair. 272,694, 2-21-84, Cl. D6-57.000.
Claman, Mike T. Sofa. 272,695, 2-21-84, Cl. D6-57.000.
Cline, Carl R., II: *See—*
Mailer, Werner H.; and Cline, Carl R., II, 272,741, Cl. D14-111.000.
Coffman, Quentin H. Dental hygiene device. 272,763, 2-21-84, Cl. D24-15.000.
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., to Masco Corporation of Indiana. Radio. 272,737, 2-21-84, Cl. D14-68.000.
Cosmos, Pete; and McCleerey, Earl W., to AMP Incorporated. 180° Cable strain relief and cover for an electrical connector. 272,733, 2-21-84, Cl. D13-24.000.
CPG Products Corp.: *See—*
Boudreaux, Mark D., 272,752, Cl. D21-87.000.
Goldberg, Dale I., 272,678, Cl. D3-73.000.
Designs for Vision, Inc.: *See—*
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 272,745, Cl. D16-130.000.
Dohogne, Charles L., to ACE Orthopedic Manufacturing, Inc. Orthopedic pin. 272,764, 2-21-84, Cl. D24-33.000.
Doyel, John S. Photograph display. 272,701, 2-21-84, Cl. D6-234.000.
Drag Specialties, Inc.: *See—*
Stahel, Alwin J., 272,729, Cl. D12-126.000.
Drucker, Fred F.: *See—*
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, 272,705, Cl. D7-77.000.
Endress + Hauser, Inc.: *See—*
Moore, Brian E.; and Buis, Richard D., 272,732, Cl. D13-13.000.
Evans, Arthur, to Mohawk Industries, Inc. Stove grille. 272,755, 2-21-84, Cl. D23-128.000.
Faidide, Christian, to S.A.R.L. Wichard. Safety hook. 272,717, 2-21-84, Cl. D8-367.000.
Fasco Controls Corporation: *See—*
Muench, Rudolph E., 272,716, Cl. D8-356.000.
Fee, Robert W.; and Robbins, Richard J., to Rival Manufacturing Co. Air cleaner or the like. 272,757, 2-21-84, Cl. D23-149.000.
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, to Designs for Vision, Inc. Adjustable optical coupler device. 272,745, 2-21-84, Cl. D16-130.000.
Firth, David G., to firth design group inc. Motorcycle fairing. 272,731, 2-21-84, Cl. D12-182.000.
firth design group inc.: *See—*
Firth, David G., 272,731, Cl. D12-182.000.
Frick, William G., Jr. Telephone mount indicia display. 272,735, 2-21-84, Cl. D14-59.000.
Frost, George H.: *See—*
Hayes, Robert R.; and Frost, George H., 272,713, Cl. D8-90.000.
Garelick, Herbert J.: *See—*
Bove, Steven C.; and Garelick, Herbert J., 272,677, Cl. D3-9.000.
Garner, Walter H. Half round hardie. 272,706, 2-21-84, Cl. D8-46.000.
General Electric Company: *See—*
Mailer, Werner H.; and Cline, Carl R., II, 272,741, Cl. D14-111.000.
Gidlund, Per A. L.; and Wedlin, Per G., to Atlas Copco Aktiebolag. Pneumatic riveting hammer. 272,708, 2-21-84, Cl. D8-61.000.
Glass, Henry: *See—*
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, 272,705, Cl. D7-77.000.
Godfrey, Danny. Modular storage rack for bottles or the like. 272,699, 2-21-84, Cl. D6-188.000.
Goldberg, Dale I., to CPG Products Corp. Carrying case for dolls. 272,678, 2-21-84, Cl. D3-73.000.
Gotham Chicago Corporation: *See—*
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, 272,705, Cl. D7-77.000.
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, to Gotham Chicago Corporation. Portable cooler. 272,705, 2-21-84, Cl. D7-77.000.
Gray, James M.: *See—*
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., 272,737, Cl. D14-68.000.
Grey, Alan P. Bottle. 272,721, 2-21-84, Cl. D9-349.000.
Griset, Norman. Woodworking straight edge. 272,711, 2-21-84, Cl. D8-71.000.
GTE Automatic Electric Labs Inc.: *See—*
Kaczkos, John E., 272,736, Cl. D14-66.000.
Guerriero, Nathan J. Corner bracket for use on a scaffold, or similar article. 272,766, 2-21-84, Cl. D25-68.000.
H,H&B, Inc.: *See—*
Brackmann, Rogers F., 272,751, Cl. D21-86.000.
Haag, John H., Sr., to Ball Corporation. Pallet or the like. 272,768, 2-21-84, Cl. D34-38.000.
Haakenson, David. Jar or the like. 272,722, 2-21-84, Cl. D9-352.000.
Hallgren, Leif, to Hallgrens Industri AB. Child's security seat for vehicles. 272,692, 2-21-84, Cl. D6-9.000.
Hallgrens Industri AB: *See—*
Hallgren, Leif, 272,692, Cl. D6-9.000.
Hayes, Robert R.; and Frost, George H., to Oatey Co. Hand plane. 272,713, 2-21-84, Cl. D8-90.000.
Horton, Charles M.: *See—*
Aulbert, Harold V.; and Horton, Charles M., 272,698, Cl. D6-154.000.
Hoshino, Daiji, to Komatsu Zenoah Co. Attachment for snow shovel. 272,742, 2-21-84, Cl. D15-11.000.
IDL Mfg. & Sales Corp.: *See—*
Smith, Lawrence D., 272,704, Cl. D7-50.000.
Irish, Sally G. Rug. 272,700, 2-21-84, Cl. D6-211.000.
Kaczkos, John E., to GTE Automatic Electric Labs Inc. Pushbutton dial for a telephone set or the like. 272,736, 2-21-84, Cl. D14-66.000.
Kaneko, Toshiro. Box for cultivating vegetables or the like. 272,726, 2-21-84, Cl. D11-155.000.
Kaneko, Toshiro. Box for cultivating vegetables or the like. 272,727, 2-21-84, Cl. D11-155.000.
Killy, Earl J., to Manville Service Corporation. Carrier case blank. 272,724, 2-21-84, Cl. D9-433.000.
Kimble, Thomas E., to Baldwin Piano & Organ Company. Organ. 272,746, 2-21-84, Cl. D17-6.000.
Kingsley, John M., Jr. Spring clip for frameless picture mounting. 272,702, 2-21-84, Cl. D6-246.000.
Kirk, Velma R. Pocket insert for a notebook. 272,748, 2-21-84, Cl. D19-33.000.
Knox, David J. Clamp for plating barrel. 272,743, 2-21-84, Cl. D15-144.000.
Knudson, Giltner J. Strain relief cable fastener. 272,718, 2-21-84, Cl. D8-387.000.
Kojima, Hiroshi: *See—*
Osawa, Tooru; and Kojima, Hiroshi, 272,730, Cl. D12-147.000.
Komatsu Zenoah Co.: *See—*
Hoshino, Daiji, 272,742, Cl. D15-11.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,758, 2-21-84, Cl. D23-166.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,759, 2-21-84, Cl. D23-166.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,760, 2-21-84, Cl. D23-166.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,761, 2-21-84, Cl. D23-166.000.
Kverneland A/S: *See—*
Skjaeveland, Magne, 272,719, Cl. D8-394.000.
Skjaeveland, Magne, 272,720, Cl. D8-394.000.
Larkin, Mark E., to Abbott Laboratories. Pull tab tear cap for medical liquid container. 272,725, 2-21-84, Cl. D9-435.000.
LeGrand, C. William. Combined sliding screen door pull with screen guard therefor. 272,714, 2-21-84, Cl. D8-301.000.
Lepczynski, Richard: *See—*
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 272,745, Cl. D16-130.000.
Leviton Manufacturing Company, Inc.: *See—*
Bienwald, Wolfgang F.; and Balaban, David B., 272,734, Cl. D13-32.000.
Luntz, Richard. Writing instrument or similar article. 272,750, 2-21-84, Cl. D19-45.000.
MacDonald, Arch J. Combined flashlight and umbrella. 272,676, 2-21-84, Cl. D3-5.000.
Mailer, Werner H.; and Cline, Carl R., II, to General Electric Company. Data printer. 272,741, 2-21-84, Cl. D14-111.000.
Manville Service Corporation: *See—*
Killy, Earl J., 272,724, Cl. D9-433.000.
Masco Corporation of Indiana: *See—*
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., 272,737, Cl. D14-68.000.
McCleerey, Earl W.: *See—*
Cosmos, Pete; and McCleerey, Earl W., 272,733, Cl. D13-24.000.
Miller, David W., to Benjamin & Medwin, Inc. Food mold. 272,703, 2-21-84, Cl. D7-43.000.
Mobex Corporation: *See—*
Rehberg, Thomas R.; and Moroney, John W., 272,756, Cl. D23-128.000.
Modern Home Products Corp.: *See—*
Koziol, Walter, 272,758, Cl. D23-166.000.
Koziol, Walter, 272,759, Cl. D23-166.000.
Koziol, Walter, 272,760, Cl. D23-166.000.
Koziol, Walter, 272,761, Cl. D23-166.000.
Mohawk Industries, Inc.: *See—*
Evans, Arthur, 272,755, Cl. D23-128.000.
Moore, Brian E.; and Buis, Richard D., to Endress + Hauser, Inc. Explosion proof enclosure for electrical apparatus or similar article. 272,732, 2-21-84, Cl. D13-13.000.
Moroney, John W.: *See—*
Rehberg, Thomas R.; and Moroney, John W., 272,756, Cl. D23-128.000.
Muench, Rudolph E., to Fasco Controls Corporation. Cord lock. 272,716, 2-21-84, Cl. D8-356.000.
Nemeth, Josef, to Aktiebolaget Wicanders Korkfabriker. Panel for floors, walls, or the like. 272,767, 2-21-84, Cl. D25-80.000.
Nussbaum, Ernest. Demountable stringed musical instrument. 272,747, 2-21-84, Cl. D17-14.000.
Oatey Co.: *See—*
Hayes, Robert R.; and Frost, George H., 272,713, Cl. D8-90.000.
Office, Gerald S., Jr., to Ponderosa, Inc. Restaurant building. 272,765, 2-21-84, Cl. D25-25.000.
Ohie, Yoshihisa, to Sharp Corporation. Word processor. 272,739, 2-21-84, Cl. D14-106.000.

Ohie, Yoshihisa, to Sharp Corporation. Floppy disc drive. 272,740, 2-21-84, Cl. D14-109.000.
Oleksy, Waldyslaw: *See*—
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 272,745, Cl. D16-130.000.
Osawa, Tooru; and Kojima, Hiroshi, to Bridgestone Tire Company Limited. Vehicle tire. 272,730, 2-21-84, Cl. D12-147.000.
Ponderosa, Inc.: *See*—
Office, Gerald S., Jr., 272,765, Cl. D25-25.000.
Rabold, Lutz: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 272,744, Cl. D16-34.000.
Rehberg, Thomas R.; and Moroney, John W., to Mobex Corporation. Front panel for a fireplace. 272,756, 2-21-84, Cl. D23-128.000.
Riley, Richard E.: *See*—
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., 272,737, Cl. D14-68.000.
Rival Manufacturing Co.: *See*—
Fee, Robert W.; and Robbins, Richard J., 272,757, Cl. D23-149.000.
Robbins, Richard J.: *See*—
Fee, Robert W.; and Robbins, Richard J., 272,757, Cl. D23-149.000.
S.A.R.L. Wichard: *See*—
Faidide, Christian, 272,717, Cl. D8-367.000.
Schlagheck, Norbert; and Rabold, Lutz, to AGFA-Gevaert AG. X-ray-film-processor. 272,744, 2-21-84, Cl. D16-34.000.
Shaffer, Frank E. Large headed cable cutter. 272,707, 2-21-84, Cl. D8-52.000.
Shames, Harold: *See*—
Shames, Sidney J.; and Shames, Harold, 272,696, Cl. D6-89.000.
Shames, Sidney J.; and Shames, Harold, 272,697, Cl. D6-122.000.
Shames, Sidney J.; and Shames, Harold. Standing soap dish. 272,696, 2-21-84, Cl. D6-89.000.
Shames, Sidney J.; and Shames, Harold. Robe hook. 272,697, 2-21-84, Cl. D6-122.000.
Sharp Corporation: *See*—
Ohie, Yoshihisa, 272,739, Cl. D14-106.000.
Ohie, Yoshihisa, 272,740, Cl. D14-109.000.
Skjaeveland, Magne, to Kverneland A/S. Plate for assembling elements of agricultural machinery or the like. 272,719, 2-21-84, Cl. D8-394.000.
Skjaeveland, Magne, to Kverneland A/S. Plate for assembling elements of agricultural machinery or the like. 272,720, 2-21-84, Cl. D8-394.000.
Smith, Lawrence D., to IDL Mfg. & Sales Corp. Measuring cup. 272,704, 2-21-84, Cl. D7-50.000.
Stahel, Alwin J., to Drag Specialties, Inc. Motorcycle side cover. 272,729, 2-21-84, Cl. D12-126.000.
Stanley Works, The: *See*—
Bailey, Wilbur J., 272,715, Cl. D8-331.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,679, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,680, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,681, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,682, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,683, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,684, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,685, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,686, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,687, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,688, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,689, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,690, 2-21-84, Cl. D4-25.000.
Stocchi, Gabriele, to Avantgarde S.p.A. Toothbrush. 272,691, 2-21-84, Cl. D4-25.000.
Stow, Mark L.: *See*—
Coons, John C.; Beirise, Jean M.; Riley, Richard E.; Gray, James M.; and Stow, Mark L., 272,737, Cl. D14-68.000.
Svensson, Agneta E.: *See*—
Svensson, Linda M.; and Svensson, Agneta E., 272,728, Cl. D12-9.000.
Svensson, Linda M.; and Svensson, Agneta E. Sled. 272,728, 2-21-84, Cl. D12-9.000.
Tanner, John C., II, to Abbott Laboratories. Flexible container for medical liquids. 272,762, 2-21-84, Cl. D24-58.000.
Teradata Corporation: *See*—
Best, Melvin H. M., 272,738, Cl. D14-102.000.
Thor Power Tool Company: *See*—
Antonick, Milton J.; and Thorwaldsen, Stanley E., 272,710, Cl. D8-67.000.
Thorwaldsen, Stanley E.: *See*—
Antonick, Milton J.; and Thorwaldsen, Stanley E., 272,710, Cl. D8-67.000.
U.S. Cap, Inc.: *See*—
Varsane, Robert G., 272,674, Cl. D2-260.000.
Varsane, Robert G., to U.S. Cap, Inc. Front panel for a cap. 272,674, 2-21-84, Cl. D2-260.000.
Vero, Radu. Artists template. 272,749, 2-21-84, Cl. 19-39.000.
Wedlin, Per G.: *See*—
Gidlund, Per A. L.; and Wedlin, Per G., 272,708, Cl. D8-61.000.

LIST OF PLANT PATENTEES

AMFAC Garden Perry's Inc.: *See*—
Whiting, Hubert F., 5,194, Cl. 88.000.
Fischer, Arnold, to Pan American Plant Company. African violet plant. 5,193, 2-21-84, Cl. 69.000.
Pan American Plant Company: *See*—
Fischer, Arnold, 5,193, Cl. 69.000.
Whiting, Hubert F., to AMFAC Garden Perry's Inc. Digitaria Didactyla grass plant. 5,194, 2-21-84, Cl. 88.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 21, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

412 4,432,099
424 4,432,100

CLASS 3

20 4,432,101

CLASS 4

228 4,432,102
525 4,432,103
555 4,432,104
597 4,432,105
633 4,432,106

CLASS 5

436 4,432,107
443 4,432,108
478 4,432,109
481 4,432,110

CLASS 8

158 4,432,111
414 4,432,769
638 4,432,770

CLASS 15

36 4,432,112
97 R 4,432,113
104.93 4,432,114
105.5 4,432,115

CLASS 16

35 D 4,432,116

CLASS 17

66 4,432,117

CLASS 19

159 R 4,432,118

CLASS 24

299 4,432,120
343 4,432,121
603 4,432,119

CLASS 29

156.5 A 4,432,122
157 A 4,432,123
235 4,432,124
402.08 4,432,125
410 4,432,126
429 4,432,128
436 4,432,127
447 4,432,129
563 4,432,130
569 L 4,432,131
571 4,432,132
4,432,133
578 4,432,134
598 4,432,135

CLASS 30

32 4,432,136
292 4,432,137
294 4,432,138
381 4,432,139

CLASS 33

20 C 4,432,140
169 R 4,432,141
174 F 4,432,142
178 F 4,432,143
180 AT 4,432,144
288 4,432,145
334 4,432,146

CLASS 34

46 4,432,147
58 4,432,148

CLASS 38

55 4,432,149
102.5 4,432,150

CLASS 40

10 D 4,432,151
152.1 4,432,152
324 4,432,153
531 4,432,154

CLASS 43

22 4,432,155
42.31 4,432,156
4,432,157

CLASS 44

51 4,432,771

CLASS 46

131 4,432,158
177 4,432,159

CLASS 47

2 4,432,160
41 R 4,432,161

CLASS 48

66 4,432,772
197 R 4,432,773

CLASS 49

55 4,432,162
63 4,432,163
209 4,432,164
351 4,432,165
491 4,432,166
502 4,432,167

CLASS 51

163.1 4,432,168
424 4,432,169

CLASS 52

28 4,432,170
79.1 4,432,171
98 4,432,172
167.7 4,432,173
222 4,432,174
224 4,432,175
293 4,432,176
309.17 4,432,177
334 4,432,178
396 4,432,179
407 4,432,180
459 4,432,181
480 4,432,182
533 4,432,183
732 4,432,184

CLASS 53

69 4,432,186
137 4,432,187
138 R 4,432,185
436 4,432,188
497 4,432,189

CLASS 55

25 4,432,774
41 4,432,775
77 4,432,776
86 4,432,777
212 4,432,778
233 4,432,779

CLASS 56

1 4,432,190
11.8 4,432,191
15.3 4,432,192

CLASS 57

3 4,432,193
22 4,432,194
87 4,432,195
204 4,432,196
261 4,432,197
276 4,432,198
294 4,432,199
304 4,432,200

CLASS 60

39.161 4,432,201
221 4,432,202
511 4,432,203
520 4,432,204
605 4,432,205
606 4,432,206
723 4,432,207

CLASS 62

55.5 4,432,208
62 4,432,209
126 4,432,210
155 4,432,211
229 4,432,212
239 4,432,213
324.6 4,432,215
341 4,432,214
514 R 4,432,216

CLASS 65

2 4,432,780
18.2 4,432,781
25.2 4,432,782
239 4,432,783

CLASS 68

5 D 4,432,217

CLASS 70

395 4,432,218
456 R 4,432,219

CLASS 71

88 4,432,784
90 4,432,785
4,432,786
94 4,432,787

CLASS 72

53 4,432,220
148 4,432,221
350 4,432,222

CLASS 73

7 4,432,223
23 4,432,224
23.1 4,432,225
27 A 4,432,226
49.8 4,432,227
119 A 4,432,228
146 4,432,229
168 4,432,230
290 V 4,432,231
432 R 4,432,232
432 SD 4,432,233
597 4,432,234
611 4,432,235
631 4,432,236
632 4,432,237
724 4,432,238
800 4,432,239
822 4,432,240
861.22 4,432,241
4,432,242
861.31 4,432,243
861.77 4,432,244
862.32 4,432,245
862.53 4,432,246
862.67 4,432,247
863.03 4,432,248
863.83 4,432,249
864.34 4,432,250

CLASS 74

337.5 4,432,251
469 4,432,252
573 R 4,432,253
574 4,432,254
869 4,432,255

CLASS 75

3 4,432,788
35 4,432,789
41 4,432,790
65 R 4,432,791
123 R 4,432,792
130 R 4,432,793
239 4,432,794
245 4,432,795

CLASS 81

57.39 4,432,256
464 4,432,257

CLASS 82

1.2 4,432,258
2 E 4,432,259

CLASS 83

13 4,432,260
37 4,432,261
311 4,432,262
438 4,432,263
835 4,432,264

CLASS 84

1.01 4,432,265
1.03 4,432,266
293 4,432,267

CLASS 86

1 R 4,432,268

CLASS 89

1.816 4,432,269

CLASS 91

436 4,432,270
527 4,432,271

CLASS 98

1 4,432,272
43 C 4,432,273

CLASS 99

400 4,432,274
453 4,432,276
625 4,432,275

CLASS 100

37 4,432,277
53 4,432,278
171 4,432,279

CLASS 101

230 4,432,280
334 4,432,281
350 4,432,282

CLASS 102

244 4,432,283

CLASS 104

7 R 4,432,284

CLASS 106

19 4,432,796
34 4,432,797
38.3 4,432,798
85 4,432,799
4,432,800
92 4,432,801
163 R 4,432,802
304 4,432,803
306 4,432,804

CLASS 109

49.5 4,432,285

CLASS 110

193 4,432,286
212 4,432,287
266 4,432,288
336 4,432,289
346 4,432,290

CLASS 111

7.1 4,432,291
52 4,432,292

CLASS 112

231 4,432,293
262.3 4,432,294
4,432,295
266.2 4,432,296
278 4,432,297

CLASS 114

39 4,432,298

CLASS 116

137 R 4,432,299
308 4,432,300

CLASS 118

315 4,432,301
410 4,432,302

CLASS 119

17 4,432,303
18 4,432,304
98 4,432,305
100 4,432,306

CLASS 122

14 4,432,307

CLASS 123

1 A 4,432,308
41.66 4,432,309
58 AB 4,432,310
90.67 4,432,311
188 VA 4,432,312
193 P 4,432,313
238 4,432,314
310 4,432,315
328 4,432,316
339 4,432,317
4,432,318
357 4,432,319
4,432,320
380 4,432,321
416 4,432,322
427 4,432,323
438 4,432,324
491 4,432,325
501 4,432,326
502 4,432,327
516 4,432,328
557 4,432,329
571 4,432,330
4,432,331
587 4,432,332

CLASS 124

3 4,432,333

CLASS 126

9 B 4,432,334
60 4,432,335
91 R 4,432,336
121 4,432,337
256 4,432,338
368 4,432,339
390 4,432,340
417 4,432,341
418 4,432,342
424 4,432,343
438 4,432,344
439 4,432,345
445 4,432,346

CLASS 127

37 4,432,805
48 4,432,806

CLASS 128

1 R 4,432,347
1.1 4,432,348
4 4,432,349
10 4,432,350
17 4,432,351
4,432,352
24 R 4,432,353
30 4,432,354
56 4,432,355
75 4,432,356
79 4,432,357
92 BB 4,432,358
134 4,432,359
419 F 4,432,361
419 PG 4,432,360
4,432,362
419 PS 4,432,363
484 4,432,364
635 4,432,365
4,432,366
639 4,432,367
644 4,432,368
653 4,432,369
654 4,432,370
660 4,432,371
675 4,432,372
680 4,432,373
694 4,432,374
705 4,432,375
774 4,432,376
786 4,432,377

CLASS 131

277 4,432,378

CLASS 133

1 R 4,432,379

CLASS 134

2 4,432,807
3 4,432,808
104 4,432,380

CLASS 135

87 4,432,381
118 4,432,382

CLASS 136

230 4,433,198
246 4,433,199
251 4,433,200
4,433,201
255 4,433,202

CLASS 137

77 4,432,383
247.11 4,432,384
271 4,432,385
327 4,432,386
329.02 4,432,387
403 4,432,388
469 4,432,389
625.46 4,432,390
625.64 4,432,391
883 4,432,392

CLASS 138

30 4,432,393
96 T 4,432,394
109 4,432,395
4,432,396

CLASS 139

13 R 4,432,397
91 4,432,398
370.2 4,432,399

CLASS 140

92.1 4,432,400

CLASS 141

4 4,432,401

CLASS 144

193 A 4,432,402
342 4,432,403

CLASS 145

2 R 4,432,404

CLASS 148

1.5 4,432,809
4,432,810
2 4,432,811
36 4,432,812
125 4,432,813

CLASS 149

19.1 4,432,814
19.3 4,432,815
4,432,816
19.5 4,432,817
22 4,432,818
45 4,432,819

CLASS 152

424 4,432,405

CLASS 156

82 4,432,820
89 4,432,821
148 4,432,822
164 4,432,823
165 4,432,824
244.11 4,432,826
245 4,432,827
285 4,432,828
307.3 4,432,825
4,432,829
384 4,432,830
467 4,432,831
630 4,432,832

CLASS 160

199 4,432,406

CLASS 162

158 4,432,833
4,432,834
212 4,432,835
237 4,432,836

CLASS 164

448 4,432,407

CLASS 165

1 4,432,408
8 4,432,409
32 4,432,410
47 4,432,411
93 4,432,412
133 4,432,413
140 4,432,414
166 4,432,415
173 B1 4,349,070

CLASS 166

117.5 4,432,416
120 4,432,417
133 4,432,418

188 4,432,419
355 4,432,420

CLASS 172

375 4,432,421

CLASS 174

30 4,433,203
48 4,433,204
84 C 4,433,205
356 4,433,206

CLASS 175

61 4,432,422
75 4,432,423

CLASS 178

22.09 4,433,207
46 4,433,208

CLASS 179

1.5 S 4,433,211
2 C 4,433,212
18 FA 4,433,213
115.5 ES 4,433,214
170 NC 4,433,215
178 4,433,216

CLASS 180

6.48 4,432,424
8 A 4,432,425
4,432,426
24 4,432,427
73 D 4,432,428
127 4,432,429
197 4,432,430
248 4,432,431
287 4,432,432

CLASS 181

204 4,432,433
225 4,432,434

CLASS 182

82 4,432,435
97 4,432,436
234 4,432,437

CLASS 187

9 E 4,432,438
29 R 4,432,439

CLASS 188

71.2 4,432,440
267 4,432,441
290 4,432,442

CLASS 192

0.076 4,432,445
12 R 4,432,443
58 B 4,432,444
84 C 4,432,446

CLASS 194

100 A 4,432,447

CLASS 198

735 4,432,448
777 4,432,449
832 4,432,450

CLASS 200

5 R 4,433,217
11 R 4,433,218
83 R 4,433,219
144 AP 4,433,220
4,433,221
153 J 4,433,222
159 B 4,433,223
330 4,433,224
340 4,433,225

CLASS 203

37 4,432,837

CLASS 204

11 4,432,838
12 4,432,839
14 N 4,432,840
4,432,841
41 4,432,842
51 4,432,843
54 R 4,432,844
56 R 4,432,845
129.95 4,432,846
158 R 4,432,847
159.17 4,432,848
180 R 4,432,849
181 C 4,432,850
181 F 4,432,852
181 R 4,432,851
192 E 4,432,853
206 4,432,854
207 4,432,855
237 4,432,856
253 4,432,857
257 4,432,858
296 4,432,859
4,432,860

CLASS 206

216 4,432,451
354 4,432,452
387 4,432,453
425 4,432,454
531 4,432,455
566 4,432,456

CLASS 208

11 R 4,432,861
64 4,432,862
113 4,432,863
120 4,432,864
183 4,432,865
321 4,432,866

CLASS 209

140 4,432,867
172.5 4,432,868
557 4,432,457
564 4,432,458

CLASS 210

143 4,432,870
195.1 4,432,871
205 4,432,872
223 4,432,873
242.4 4,432,874
500.2 4,432,875
602 4,432,869
652 4,432,876
656 4,432,877
662 4,432,878
699 4,432,879
725 4,432,880

CLASS 211

13 4,432,459
50 4,432,460

CLASS 215

252 4,432,461
365 4,432,462

CLASS 217

12 R 4,432,463

CLASS 219

10.41 4,433,226
4,433,227
10.55 R 4,433,228
84 4,433,229
118 4,433,230
253 4,433,231
502 4,433,232
553 4,433,233

CLASS 220

2.1 A 4,432,464
235 4,432,465
276 4,432,466
334 4,432,467

CLASS 222

55 4,432,468
134 4,432,469
135 4,432,470
136 4,432,471
174 4,432,472
327 4,432,473
402.15 4,432,474
509 4,432,475

CLASS 224

164 4,432,476
222 4,432,477
321 4,432,478
322 4,432,479
329 4,432,480

CLASS 226

9 4,432,481
181 4,432,482

CLASS 227

8 4,432,483
126 4,432,484

CLASS 228

44.1 R 4,432,485
49 A 4,432,486
194 4,432,487

CLASS 229

4,432,488
21 4,432,489
22 4,432,490
33 4,432,491

CLASS 235

132 E 4,433,234

CLASS 236

92 B 4,432,492

CLASS 237

12.3 R 4,432,493

CLASS 239

177 CC 4,432,494
205 4,432,495
327 4,432,496
589 4,432,497

CLASS 241

21 4,432,498
30 4,432,499
57 4,432,500

CLASS 242

47 4,432,501
4,432,503
50 4,432,502
55.2 4,432,504
56 R 4,432,505
68.3 4,432,506
107.4 A 4,432,507
195 4,432,508
4,432,509
200 4,432,510

CLASS 244

3.13 4,432,511
3.22 4,432,512
99 4,432,513
118.5 4,432,514
123 4,432,515
219 4,432,516

CLASS 246

28 F 4,432,517

CLASS 248

48.2 4,432,518
49 4,432,519
56 4,432,520
176 4,432,521
215 4,432,522
250 4,432,523
395 4,432,524
430 4,432,525
542 4,432,526
548 4,432,527
603 4,432,528

CLASS 249

52 4,432,529
142 4,432,530

CLASS 250

201 4,433,235
213 VT 4,433,236
222.1 4,433,237
227 4,433,238
255 4,433,239
256 4,433,240
282 4,433,241
358.1 4,433,242
397 4,433,243
455.1 4,433,244
458.1 4,433,245
492.1 4,433,246
492.2 4,433,247

CLASS 252

8.5 A 4,432,881
8.55 R 4,432,882
12 4,432,883
180 4,432,884
299.61 4,432,885
301.27 4,432,886
331 4,432,887
354 4,432,888
518 4,432,891
628 4,432,892
631 4,432,893
632 4,432,894

CLASS 254

100 4,432,531
291 4,432,532

CLASS 260

112 R 4,432,895
112.5 R 4,432,896
140 4,432,897
145 A 4,432,898
157 4,432,899
160 4,432,900
239 A 4,432,901
239 HM 4,432,902
239.1 4,432,903
330.6 4,432,904
397.1 4,432,905
410.9 R 4,432,906
429.2 4,432,907
465 D 4,432,908
501.11 4,432,909
545 R 4,432,910

CLASS 261

44 C 4,432,911
93 4,432,912
97 4,432,913
111 4,432,914

CLASS 264

0.5 4,432,915
24 4,432,916
40.1 4,432,917
43 4,432,918
46.4 4,432,919
49 4,432,920
109 4,432,921
119 4,432,922
206 4,432,923
210.8 4,432,924
235 4,432,925
282 4,432,926
4,432,927
519 4,432,928

CLASS 266

44 4,432,533
225 4,432,534
239 4,432,535
280 4,432,536

CLASS 267

8 R 4,432,537

CLASS 269

92 4,432,538

CLASS 271

3.1 4,432,539
8 A 4,432,540
251 4,432,541

CLASS 272

27 W 4,432,542
126 4,432,543

CLASS 273

1 GC 4,432,545
1 M 4,432,544
63 A 4,432,546
65 R 4,432,547
153 S 4,432,548
167 H 4,432,549
169 4,432,550
183 A 4,432,552
183 C 4,432,551
244 4,432,553
272 4,432,554

CLASS 277

25 4,432,555
73 4,432,556
153 4,432,557
180 4,432,558

CLASS 279

4 4,432,559

CLASS 280

47.19 4,432,560
281 LP 4,432,561
300 4,432,562
477 4,432,563
689 4,432,564
779 4,432,565
807 4,432,566

CLASS 283

83 4,432,567

CLASS 285

3 4,432,568
18 4,432,569
24 4,432,570
283 4,432,571
412 4,432,572

CLASS 290

44 4,433,248

CLASS 292

37 4,432,573
91 4,432,574
341.18 4,432,575
357 4,432,576

CLASS 294

16 4,432,577
69 R 4,432,578
87.2 4,432,579

CLASS 296

39 A 4,432,580
136 4,432,581

CLASS 297

316 4,432,582
330 4,432,583

CLASS 299

25 4,432,584

CLASS 303

10 4,432,585
115 4,432,586

CLASS 307

31 4,433,249
66 4,433,250
149 Re.31,524
246 4,433,251
269 4,433,252
297 4,433,253
350 4,433,254
353 4,433,255
358 4,433,256
443 4,433,257
456 4,433,258

CLASS 308

6 C 4,432,587
234 4,432,588

CLASS 310

89 4,433,259
156 4,433,260
4,433,261
214 4,433,262
233 4,433,263
321 4,433,264

CLASS 312

198 4,432,589
257 SK 4,432,590
297 4,432,591

CLASS 313

22 4,433,265
135 4,433,266
402 4,433,267
440 4,433,268
632 4,433,269

CLASS 315

5.35 4,433,270
63 4,433,271
290 4,433,272

CLASS 318

135 4,433,273
283 4,433,274
578 4,433,275
729 4,433,276

CLASS 320

24 4,433,277
48 4,433,278

CLASS 322

3 4,433,279
89 4,433,280

CLASS 323

246 4,433,281
281 4,433,282
314 4,433,283
361 4,433,284
364 4,433,285

CLASS 324

61 R 4,433,286
115 4,433,287
158 D 4,433,288
215 4,433,289
230 4,433,290
244 4,433,291
404 4,433,292
424 4,433,293
426 4,433,294
429 4,433,295
452 4,433,296
457 4,433,297
4,433,298
464 4,433,299

CLASS 329

136 4,433,300

CLASS 330

109 4,433,301
257 4,433,302
264 4,433,303
281 4,433,304
296 4,433,305
297 4,433,306
4,433,307

CLASS 331

17 4,433,308
65 4,433,309

CLASS 332

9 R 4,433,310
11 D 4,433,311
22 4,433,312

CLASS 333

109 4,433,313
110 4,433,314
174 4,433,315
189 4,433,316

CLASS 335

151 4,433,317
213 4,433,318

CLASS 338

34 4,433,319
35 4,433,320
42 4,433,321
162 4,433,322

CLASS 339

103 M 4,432,592
105 4,432,593
258 F 4,432,594

CLASS 340

310 A 4,433,326
347 DD 4,433,327
555 4,433,328
606 4,433,329
750 4,433,330
825.83 4,433,331
870.37 4,433,332
923 4,433,324
937 4,433,325
970 4,433,323

CLASS 343

18 E 4,433,333
450 4,433,334
463 4,433,335
728 4,433,336
765 4,433,337

CLASS 346

34 4,433,338
78 4,433,339
135.1 4,433,340
140 R 4,433,341

CLASS 350

1.1 4,432,595
1.3 4,432,596
3.70 4,432,597
6.7 4,432,598
96.15 4,432,599
96.18 4,432,600
96.19 4,432,601
96.20 4,432,602
96.21 4,432,603
4,432,604
96.23 4,432,605
96.33 4,432,606
96.34 4,432,607
128 4,432,608
266 4,432,609
331 R 4,432,610
342 4,432,611
357 4,432,612
358 4,432,613
386 4,432,614
427 4,432,615

CLASS 351

106 4,432,616
211 4,432,617

CLASS 353

25 4,432,618
119 4,432,619

CLASS 354

155 4,432,626
238.1 4,432,624
275 4,432,625
289.1 4,432,627
289.12 4,432,628
299 4,432,629
402 4,432,620
403 4,432,621
408 4,432,622
412 4,432,623

CLASS 355

1 4,432,630
3 CH 4,432,631
3 DD 4,432,632
8 4,432,633
14 D 4,432,634
30 4,432,635
35 4,432,636
4,432,637
63 4,432,638
75 4,432,639

CLASS 356

5 4,432,640
237 4,432,641
246 4,432,642
312 4,432,643
316 4,432,644
338 4,432,645
350 4,432,646
4,432,647
387 4,432,648
438 4,432,649

CLASS 357

2 4,433,342
30 4,433,343

CLASS 358

181 4,433,344
244 4,433,345
293 4,433,346
342 4,433,347

CLASS 360

51 4,433,348
66 4,433,349
70 4,433,350
76 4,433,351
105 4,433,352

CLASS 361

80 4,433,353
120 4,433,354
172 4,433,355
191 4,433,356
196 4,433,357
260 4,433,358
273 4,433,359
305 4,433,360
433 4,433,361

CLASS 362

86 4,433,362
4,433,363
109 4,433,364
189 4,433,365
267 4,433,366
370 4,433,367

CLASS 363

45 4,433,368
84 4,433,369
124 4,433,370
127 4,433,371

CLASS 364

171 4,433,373
200 4,433,374
4,433,375
4,433,376
4,433,377
4,433,378
4,433,379
431.05 4,433,381
474 4,433,382
4,433,383
525 4,433,384
554 4,433,385
563 4,433,386
B1 33,671,726
900 4,433,387
4,433,388
4,433,389
4,433,390
4,433,391
4,433,392

CLASS 365

203 4,433,393
221 4,433,394
222 4,433,395

CLASS 366

147 4,432,650
336 4,432,651

CLASS 367

105 4,433,396
122 4,433,397
140 4,433,398
157 4,433,399
163 4,433,400

CLASS 368

69 4,432,652
204 4,433,401
250 4,432,653
282 4,432,654
4,432,655

CLASS 369

43 4,433,402
48 4,433,403
66 4,433,404
77.2 4,433,405
4,433,406
127 4,433,407
170 4,433,408
4,433,409
291 4,433,410

CLASS 370

80 4,433,411

CLASS 371

25 4,433,412
4,433,413
27 4,433,414
37 4,433,415
4,433,416

CLASS 372

45 4,433,417
95 4,433,418

CLASS 373

37 4,433,419
39 4,433,420
79 4,433,421

CLASS 374

102 4,432,656
126 4,432,657
138 4,432,658

CLASS 375

10 4,433,422
30 4,433,423
106 4,433,424
113 4,433,425

CLASS 376

119 4,432,929
152 4,432,933
215 4,432,930
248 4,432,931
287 4,432,932
333 4,432,934

CLASS 377

2 4,433,426
116 4,433,372

CLASS 378

95 4,433,428
99 4,433,429
108 4,433,430
146 4,433,427
157 4,433,431
193 4,433,432

CLASS 381

1 4,433,209
7 4,433,433
30 4,433,434
53 4,433,210
94 4,433,435

CLASS 382

3 4,433,436
31 4,433,437
41 4,433,438

CLASS 384

300 4,432,659

CLASS 403

29 4,432,660
172 4,432,661
271 4,432,662
275 4,432,663

CLASS 405

3 4,432,664
129 4,432,666
143 4,432,665
4,432,667
202 4,432,668
217 4,432,669
224 4,432,670
226 4,432,671
268 4,432,672
302 4,432,673

CLASS 406

19 4,432,674
30 4,432,675
39 4,432,676

CLASS 408

203.5 4,432,677

CLASS 410

151 4,432,678

CLASS 411

34 4,432,679
103 4,432,680
180 4,432,681
311 4,432,682
340 4,432,683
366 4,432,684

CLASS 414

31 4,432,685
77 4,432,686
307 4,432,687
358 4,432,688
416 4,432,689
460 4,432,690
735 4,432,691
749 4,432,692

CLASS 415

88 4,432,693
170 A 4,432,694

CLASS 416

17 4,432,695
134 A 4,432,696
198 A 4,432,697

CLASS 417

27 4,432,698
63 4,432,699
121 4,432,700
187 4,432,701
217 4,432,703
269 4,432,702
294 4,432,704
295 4,432,705
399 4,432,706
477 4,432,707

CLASS 418

55 4,432,708
61 B 4,432,709
4,432,710
150 4,432,711
171 4,432,712

CLASS 419

2 4,432,935

CLASS 420

513 4,432,937
590 4,432,936

CLASS 422

49 4,432,938
93 4,432,939
135 4,432,940
140 4,432,941
159 4,432,942
179 4,432,943

CLASS 423

7 4,432,944
10 4,432,945
4,432,946
21.5 4,432,948
54 4,432,949
55 4,432,947
61 4,432,950
89 4,432,951
4,432,952
140 4,432,953
171 4,432,954
249 4,432,955
338 4,432,956
345 4,432,957
356 4,432,958
365 4,432,959
539 4,432,960
542 4,432,961
573 R 4,432,962

CLASS 424

1.1 4,432,963
14 4,432,964
19 4,432,965
21 4,432,966
78 4,432,967
81 4,432,968
91 4,432,969
114 4,432,970
177 4,432,971
4,432,972
180 4,432,973
184 4,432,974
201 4,432,975
241 4,432,976
248.5 4,432,977
249 4,432,978
250 4,432,979
251 4,432,980
4,432,981
256 4,432,982
265 4,432,983
267 4,432,984
4,432,985
269 4,432,986
271 4,432,987
273 P 4,432,991
273 R 4,432,988
4,432,989
4,432,990
274 4,432,992
285 4,432,993
300 4,432,994
304 4,432,995
311 4,432,996

CLASS 425

4 C 4,432,713
83.1 4,432,714
87 4,432,715
89 4,432,716
429 4,432,717
466 4,432,718
526 4,432,719
534 4,432,720

CLASS 426

7 4,432,997
43 4,432,998
583 4,432,999
599 4,433,000
614 4,433,001
640 4,433,002

CLASS 427

27 4,433,003
38 4,433,004
4,433,005
39 4,433,006
54.1 4,433,007
85 4,433,008
97 4,433,009
160 4,433,010
231 4,433,011
252 4,433,012
337 4,433,013
380 4,433,014
388.4 4,433,015

CLASS 428

34 4,433,016
89 4,433,018
110 4,433,019
113 4,433,020
116 4,433,021
158 4,433,022
182 4,433,023
198 4,433,024
207 4,433,025
252 4,433,026
260 4,433,027
378 4,433,028
407 4,433,029
476.9 4,433,030
541 4,433,031
682 4,433,032
4,433,033
693 4,433,034

CLASS 429

27 4,433,035
114 4,433,036

CLASS 430

19 4,433,037
55 4,433,038
58 4,433,039
109 4,433,040
122 4,433,041
126 4,433,042
175 4,433,043
271 4,433,044
321 4,433,045
385 4,433,046
409 4,433,047
434 4,433,048
495 4,433,049
542 4,433,050

CLASS 431

4 4,432,721
46 4,432,722
359 4,432,723
362 4,432,724
4,432,725

CLASS 432

9 4,432,726
227 4,432,727

CLASS 433

37 4,432,728
118 4,432,729
168 4,432,730

CLASS 434

11 4,432,731
298 4,432,732
339 4,432,733

CLASS 435

7 4,433,051
68 4,433,052
141 4,433,053
178 4,433,054
313 4,433,055

CLASS 436

8 4,433,056
65 4,433,057
504 4,433,058
512 4,433,059
518 4,433,060
542 4,433,061

CLASS 440

1 4,432,734
21 4,432,735
42 4,432,736
60 4,432,737

CLASS 445

34 4,432,738

CLASS 464

24 4,432,739
145 4,432,741
146 4,432,740
176 4,432,742

CLASS 474

14 4,432,743
238 4,432,744

CLASS 493

10 4,432,745
359 4,432,746

CLASS 494

2 4,432,748
8 4,432,747

CLASS 501

44 4,433,062

CLASS 502

5 4,432,889
62 4,432,890
402 4,433,063
527 4,433,064

CLASS 518

703 4,433,065
706 4,433,066

CLASS 521

51 4,433,067
54 4,433,068
99 4,433,069
107 4,433,071

CLASS 523

105 4,433,072
171 4,433,070
201 4,433,073
207 4,433,074
303 4,433,075
342 4,433,076
344 4,433,077
404 4,433,078
4,433,079
414 4,433,080
457 4,433,081

CLASS 524

27 4,433,083
62 4,433,084
83 4,433,085
112 4,433,086
117 4,433,087
153 4,433,088
294 4,433,089
295 4,433,090
386 4,433,091
414 4,433,092
433 4,433,093
451 B1 4,123,415
496 4,433,094
563 4,433,095
755 4,433,082
783 4,433,096
789 4,433,097
811 4,433,098

CLASS 525

53 4,433,099
54.42 4,433,100
70 4,433,101
75 4,433,102
81 4,433,103
180 4,433,104
211 4,433,105
215 4,433,106
232 4,433,107
255 4,433,108
314 4,433,109
323 4,433,110
326.2 4,433,111
326.9 4,433,112
327.5 4,433,113
332.6 4,433,114
417 4,433,115
420 4,433,116
425 4,433,117
437 4,433,118
442 4,433,119
501 4,433,120

CLASS 526

68 4,433,121
83 4,433,122
139 4,433,123
277 4,433,124
279 4,433,125

CLASS 527

105 4,433,126

CLASS 528

17 4,433,127
45 4,433,017
53 4,433,128
154 4,433,129
173 4,433,130
185 4,433,131
191 4,433,132
232 4,433,133
279 4,433,134
282 4,433,135
347 4,433,136
348 4,433,137
388 4,433,138

CLASS 536

17.2 4,433,139
27 4,433,140

CLASS 544

25 4,433,141
26 4,433,142
196 4,433,143
198 4,433,144
4,433,145
201 4,433,146
260 4,433,147
322 4,433,148

CLASS 546

21 4,433,149
168 4,433,150
178 4,433,151
193 4,433,152

CLASS 548

152 4,433,153
195 4,433,154

CLASS 549

205 4,433,155
227 4,433,156
255 4,433,157
332 4,433,158
411 4,433,159

CLASS 560

56 4,433,160
66 4,433,161
156 4,433,162
204 4,433,163
207 4,433,164

CLASS 562

519 4,433,165
4,433,166
534 4,433,167
073 B1 3,903,158
309 4,433,168
414 4,433,380
419 4,433,169
508 4,433,170

CLASS 568

33 4,433,171
319 4,433,172
324 4,433,173
459 4,433,174
471 4,433,175
487 4,433,176
4,433,177
4,433,178
664 4,433,179
684 4,433,180
750 4,433,181
808 4,433,182
829 4,433,183
863 4,433,184

CLASS 585

312 4,433,185
445 4,433,186
466 4,433,187
640 4,433,188
4,433,189
660 4,433,190
671 4,433,191
709 4,433,192
752 4,433,193
803 4,433,194
820 4,433,195
823 4,433,196
4,433,197

CLASS 604

2 4,432,749
4 4,432,750
49 4,432,751
53 4,432,752
55 4,432,753
56 4,432,754
4,432,755
80 4,432,756
86 4,432,767
99 4,432,757
104 4,432,758
200 4,432,768
246 4,432,760
253 4,432,761
4,432,762
262 4,432,763
283 4,432,764
4,432,766
411 4,432,759
4,432,765

CLASSIFICATION OF DESIGNS

D2—	280	272,674
	320	272,675
D3—	5	272,676
	9	272,677
	73	272,678
D4—	25	272,679
		272,680
		272,681
		272,682
		272,683
		272,684
		272,685
		272,686
		272,687
		272,688
		272,689
		272,690
		272,691
D6—	9	272,692
	57	272,693
		272,694
		272,695
	89	272,696
	122	272,697
	154	272,698
	188	272,699
	211	272,700
	234	272,701
	246	272,702
D7—	43	272,703
	50	272,704
	77	272,705
D8—	46	272,706
	52	272,707
	61	272,708
	67	272,709
		272,710
	71	272,711
	89	272,712
	90	272,713
	301	272,714
	331	272,715
	356	272,716
	367	272,717
	387	272,718
	394	272,719
		272,720
D9—	349	272,721
	352	272,722
	377	272,723
	433	272,724
	435	272,725
19—	39	272,749
D11—	155	272,726
		272,727
D12—	9	272,728
	126	272,729
	147	272,730
	182	272,731
D13—	13	272,732
	24	272,733
	32	272,734
D14—	59	272,735
	66	272,736
	68	272,737
	102	272,738
	106	272,739
	109	272,740
	111	272,741
D15—	11	272,742
	144	272,743
D16—	34	272,744
	130	272,745
D17—	6	272,746
	14	272,747
D19—	33	272,748
	45	272,750
D21—	86	272,751
	87	272,752
	153	272,753
	234	272,754
D23—	128	272,755
		272,756
	149	272,757
	166	272,758
		272,759
		272,760
		272,761
D24—	15	272,763
	33	272,764
	58	272,762
D25—	25	272,765
	68	272,766
	80	272,767
D34—	38	272,768

CLASSIFICATION OF PLANTS

P.—	69	5,193
	88	5,194

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,432,202
4 : 4,432,291
4,432,367
4,432,547
4,432,578
4,432,729
4,432,818
4,432,977
4,433,302
4,433,424
5 : 4,432,156
4,432,157
6 : 4,432,134
4,432,141
4,432,142
4,432,160
4,432,190
4,432,226
4,432,238
4,432,286
4,432,302
4,432,352
4,432,361
4,432,369
4,432,370
4,432,382
4,432,390
4,432,392
4,432,482
4,432,491
4,432,498
4,432,521
4,432,553
4,432,568
4,432,597
4,432,606
4,432,619
4,432,660
4,432,679
4,432,706
4,432,735
4,432,756
4,432,768
4,432,775
4,432,797
4,432,814
4,432,815
4,432,817
4,432,861
4,432,902
4,432,907
4,432,931
4,432,944
4,432,949
4,432,953
4,432,961
4,432,962
4,432,964
4,432,975
4,432,999
4,433,061
4,433,068
4,433,070
4,433,147
4,433,187
4,433,192
4,433,199
4,433,200
4,433,217
4,433,282
4,433,291
4,433,300
4,433,304
4,433,314
4,433,328
4,433,343
4,433,345
4,433,363
4,433,391
8 : 4,432,494
4,432,538
4,432,563
4,432,631
9 : 4,432,271
4,432,327
4,432,465
4,432,468
4,432,594
4,432,603
4,432,912
4,432,914
4,432,970
4,432,978
4,432,987
4,433,058
4,433,204
4,433,245
4,433,294
01 : 4,433,276
06 : 4,432,154
4,432,224
4,432,343
4,432,347
4,432,421
4,432,454
4,432,462
4,432,505
4,432,506
4,432,511
4,432,549
4,432,562
4,432,577
4,432,612
4,432,680
4,432,754
4,432,786
4,432,809
4,432,824
4,432,875
4,432,909
4,433,021
4,433,149
4,433,329
4,433,344
4,433,366
4,433,378
4,433,388
4,433,417
4,433,423
4,433,434
08 : 4,432,158
4,432,418
4,432,541
4,432,692
4,432,767
4,433,336
09 : 4,432,189
4,432,220
4,432,261
4,432,376
4,432,783
4,432,829
4,433,231
4,433,326
4,433,436
10 : 4,432,882
4,432,904
4,432,974
12 : 4,432,155
4,432,180
4,432,183
4,432,217
4,432,281
4,432,310
4,432,357
4,432,358
4,432,360
4,432,366
4,432,383
4,432,443
4,432,485
4,432,516
4,432,529
4,432,560
4,432,561
4,432,707
4,432,965
4,433,005
4,433,113
4,433,122
4,433,214
4,433,250
4,433,342
13 : 4,432,153
4,432,170
4,432,188
4,432,233
4,432,294
4,432,356
4,432,401
4,432,408
4,432,490
4,432,526
4,432,607
4,432,699
4,432,726
4,433,387
16 : 4,432,108
17 : 4,432,105
4,432,125
4,432,147
4,432,163
4,432,230
4,432,231
4,432,282
4,432,345
4,432,388
4,432,393
4,432,470
4,432,492
4,432,495
4,432,525
4,432,594
4,432,602
4,432,618
4,432,663
4,432,683
4,432,750
4,432,755
4,432,759
4,432,760
4,432,761
4,432,762
4,432,766
4,432,799
4,432,812
4,432,826
4,432,827
4,432,834
4,432,847
4,432,870
4,432,891
4,432,932
4,432,985
4,433,001
4,433,011
4,433,014
4,433,118
4,433,126
4,433,174
4,433,190
4,433,194
4,433,195
4,433,223
4,433,224
4,433,244
4,433,256
4,433,289
4,433,364
18 : 4,432,308
4,432,362
4,432,400
4,432,451
4,433,084
4,433,280
4,123,415
19 : 4,432,225
4,432,436
4,432,677
4,432,998
4,433,277
4,433,412
20 : 4,432,112
4,432,191
4,432,272
4,432,305
4,432,389
4,432,449
4,432,540
4,433,056
21 : 4,432,863
4,432,864
4,432,890
22 : 4,432,209
4,432,289
23 : 4,432,339
4,432,822
24 : 4,432,285
4,432,556
4,432,661
4,432,688
4,432,771
4,432,816
4,433,285
4,433,400
25 : 4,432,243
4,432,250
4,432,298
4,432,381
4,432,409
4,432,452
4,432,472
4,432,530
4,432,593
4,432,595
4,432,599
4,432,614
4,432,715
4,432,723
4,432,724
4,432,745
4,432,765
4,432,832
4,432,877
4,432,922
4,433,086
4,433,104
4,433,132
4,433,143
4,433,193
4,433,211
4,433,218
4,433,242
4,433,246
4,433,247
4,433,251
4,433,273
4,433,333
4,433,376
4,433,377
4,433,384
4,433,399
4,433,418
4,433,422

4,433,437
26 : 4,432,119
4,432,130
4,432,173
4,432,251
4,432,253
4,432,255
4,432,259
4,432,312
4,432,323
4,432,344
4,432,406
4,432,432
4,432,438
4,432,478
4,432,522
4,432,524
4,432,528
4,432,575
4,432,576
4,432,583
4,432,590
4,432,651
4,432,659
4,432,664
4,432,682
4,432,791
4,432,843
4,432,881
4,432,933
4,432,968
4,433,015
4,433,069
4,433,092
4,433,096
4,433,148
4,433,155
4,433,210
4,433,274
4,433,370
4,433,381
27 : 4,432,109
4,432,172
4,432,186
4,432,334
4,432,341
4,432,377
4,432,475
4,432,488
4,432,499
4,432,559
4,432,569
4,432,629
4,432,662
4,432,722
4,432,986
4,433,024
4,433,212
4,433,351
4,433,356
4,433,374
28 : 4,432,690
4,432,983
29 : 4,432,300
4,432,301
4,432,414
4,432,434
4,432,473
4,432,546

4,432,609
4,432,785
4,433,089
4,433,090
4,433,233
4,433,249
31 : 4,432,676
4,433,208
32 : 4,432,752
33 : 4,432,644
4,432,669
34 : 4,432,102
4,432,132
4,432,146
4,432,151
4,432,229
4,432,248
4,432,311
4,432,354
4,432,378
4,432,439
4,432,464
4,432,604
4,432,641
4,432,648
4,432,787
4,432,796
4,432,848
4,432,862
4,432,895
4,432,906
4,432,925
4,432,948
4,432,967
4,432,971
4,432,972
4,432,989
4,432,995
4,432,996
4,433,003
4,433,031
4,433,034
4,433,059
4,433,063
4,433,071
4,433,075
4,433,101
4,433,116
4,433,119
4,433,129
4,433,161
4,433,184
4,433,185
4,433,186
4,433,189
4,433,191
4,433,260
4,433,269
4,433,288
4,433,331
4,433,407
4,433,410
4,433,413
4,433,421
35 : 4,432,423
36 : 4,432,116
4,432,138
4,432,204
4,432,207

4,432,219
4,432,254
4,432,273
4,432,287
4,432,340
4,432,364
4,432,368
4,432,405
4,432,435
4,432,453
4,432,456
4,432,477
4,432,545
4,432,548
4,432,551
4,432,552
4,432,571
4,432,587
4,432,608
4,432,625
4,432,630
4,432,636
4,432,638
4,432,655
4,432,705
4,432,727
4,432,731
4,432,733
4,432,808
4,432,810
4,432,836
4,432,841
4,432,852
4,432,855
4,432,868
4,432,917
4,432,918
4,432,980
4,432,981
4,432,991
4,433,028
4,433,033
4,433,037
4,433,047
4,433,048
4,433,080
4,433,087
4,433,088
4,433,130
4,433,131
4,433,158
4,433,182
4,433,206
4,433,215
4,433,219
4,433,227
4,433,248
4,433,253
4,433,267
4,433,279
4,433,290
4,433,297
4,433,312
4,433,334
4,433,341
4,433,346
4,433,380
4,433,414
4,349,070

37 : 4,432,337
4,432,399
4,432,489
4,432,820
4,432,846
4,432,903
4,432,915
4,433,022
4,433,135
4,433,205
4,433,332
39 : 4,432,129
4,432,168
4,432,169
4,432,242
4,432,267
4,432,278
4,432,293
4,432,313
4,432,431
4,432,440
4,432,461
4,432,466
4,432,481
4,432,532
4,432,542
4,432,678
4,432,681
4,432,720
4,432,746
4,432,780
4,432,795
4,432,798
4,432,800
4,432,839
4,432,853
4,432,865
4,432,883
4,432,960
4,432,963
4,433,002
4,433,026
4,433,114
4,433,198
4,433,226
4,433,237
4,433,263
4,433,296
4,433,321
4,433,382
4,433,419
4,433,420
4,433,438
40 : 4,432,419
4,432,518
4,432,728
4,432,779
4,433,123
4,433,134
4,433,196
41 : 4,432,101
4,432,264
4,432,375
3,671,726
42 : 4,432,099
4,432,182
4,432,187
4,432,350
4,432,411

4,432,459
4,432,657
4,432,687
4,432,691
4,432,713
4,432,714
4,432,721
4,432,725
4,432,749
4,432,758
4,432,782
4,432,790
4,432,803
4,432,850
4,432,880
4,432,888
4,432,900
4,432,930
4,432,934
4,432,950
4,432,979
4,432,992
4,433,008
4,433,016
4,433,036
4,433,082
4,433,100
4,433,173
4,433,181
4,433,197
4,433,221
4,433,266
4,433,353
4,433,389
44 : 4,432,335
4,432,654
45 : 4,432,296
4,432,398
4,432,550
4,432,867
4,432,893
4,432,938
4,433,074
46 : 4,432,513
47 : 4,432,113
4,432,135
4,432,232
4,432,240
4,432,425
4,432,821
4,432,838
4,432,945
4,433,262
4,433,367
48 : 4,432,128
4,432,143
4,432,227
4,432,256
4,432,279
4,432,292
4,432,336
4,432,353
4,432,386
4,432,387
4,432,416
4,432,458
4,432,689
4,432,751
4,432,773

4,432,887
4,432,913
4,432,929
4,432,936
4,433,000
4,433,067
4,433,165
4,433,166
4,433,170
4,433,176
4,433,177
4,433,178
4,433,284
4,433,298
4,433,337
49 : 4,432,268
4,432,504
4,432,813
4,433,348
50 : 4,433,252
4,433,283
51 : 4,432,100
4,432,120
4,432,175
4,432,275
4,432,437
4,432,581
4,432,611
4,432,642
4,432,757
4,432,940
4,433,286
4,433,315
4,433,316
4,433,317
4,433,390
53 : 4,432,178
4,432,371
4,432,404
4,432,514
4,432,777
4,432,830
4,432,916
4,433,019
4,433,207
4,433,225
4,433,301
4,433,323
55 : 4,432,150
4,432,162
4,432,223
4,432,258
4,432,306
4,432,309
4,432,372
4,432,402
4,432,467
4,432,479
4,432,558
4,432,589
4,432,693
4,432,734
4,432,742
4,432,763
4,432,823
4,432,833
4,432,919
56 : 4,432,531

DESIGN PATENTS

06 : 272,706
272,707
272,711
272,714
272,718
272,738
272,743
272,748
272,754
272,756
272,763

272,764
272,766
08 : 272,709
09 : 272,674
272,702
272,715
12 : 272,724
17 : 272,705
272,725
272,735
272,736

272,751
272,758
272,759
272,760
272,761
272,762
18 : 272,732
272,768
20 : 272,757
21 : 272,746
24 : 272,747

25 : 272,703
272,728
272,755
26 : 272,710
27 : 272,677
272,722
272,729
272,731
272,753
34 : 272,704
36 : 272,693

272,694
272,695
272,696
272,697
272,701
272,734
272,745
272,749
37 : 272,698
272,716
39 : 272,678

272,713
272,737
272,750
272,752
272,765
41 : 272,712
42 : 272,733
51 : 272,700
272,741
53 : 272,676

PLANT PATENTS

06 : 5,194

U.S. GOVERNMENT PRINTING OFFICE : O—1984

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

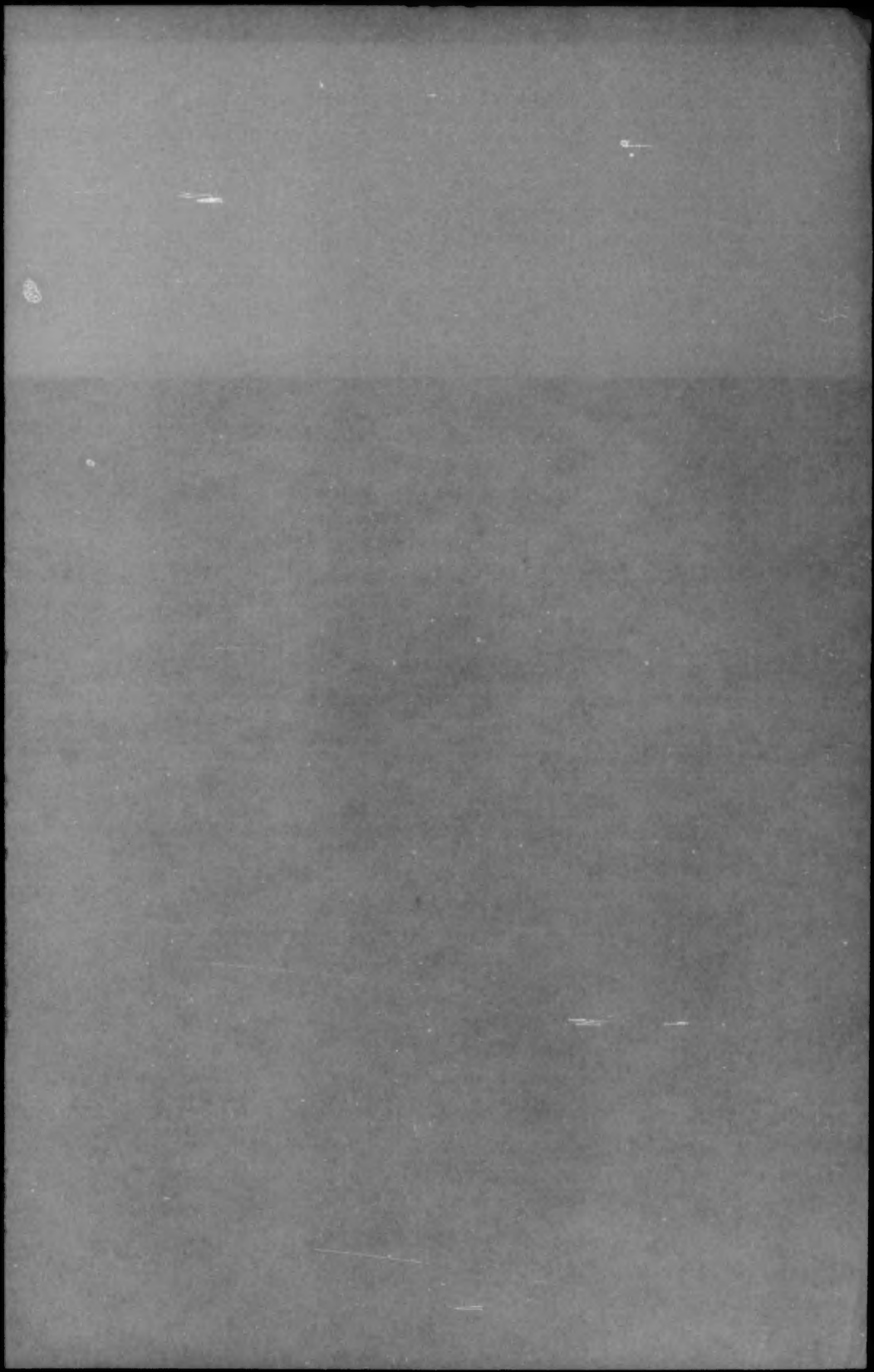
PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402



U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Gerald J. Mossinghoff, Commissioner